THE GRONOVIUS FISH COLLECTION: A CATALOGUE AND HISTORICAL ACCOUNT

ALWYNE C. WHEELER

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SYNOPSIS

The fishes collected by Laurens Theodorus Gronovius, and now preserved in the British Museum, have been re-examined. They were described by the collector during his lifetime, and in a posthumously published work; publications that were frequently referred to by Linnaeus in the tenth and twelfth editions of the *Systema Naturae*. Many of these type specimens are still extant. They have been identified and are listed in the catalogue.

A short biography of Gronovius and an historical account of the collection precede the catalogue; while the plates show some of the specimens, a page and an illustration from the manuscript, and the only known portrait of Gronovius.

1. INTRODUCTION

A LITTLE over a century ago a collection of fish skins preserved dry, and mounted on sheets of paper, was offered for sale in the auction rooms of Mr. Phillips of Bond Street, London. J. E. Gray, then Keeper of the Department of Zoology in the British Museum, viewed the collection and considering it " would be an advantageous purchase", acquired it at the sale. Subsequently, a manuscript which had been missing earlier was delivered to him. On examining the specimens he had decided that they could be dated to "about the time of Gronov", and having seen the manuscript he identified it, and the fishes, as part of Gronovius's own collection.

The specimens were incorporated in the collection of fishes at the British Museum, and the manuscript, edited by Gray, was published by order of the Trustees, in 1854. Beyond this and the publication of a short note (Gray, 1854*a*) in which he announced the acquisition of the collection, Gray took no further interest in it, but Günther, while preparing the *Catalogue of Fishes*, examined and identified the skins. It was he who first recognized some of the specimens as the types of Linnaean species, and noticed them as such in the *Catalogue;* but a number of these type specimens were not so recognized and, as the collection has never been systematically examined since his day, their significance has remained unappreciated.

I began to examine the Gronovius specimens while curating the " dry " fish collection and, in preparing a catalogue of the types described in 1854 (the manuscript edited by Gray), I realized that most of the skins were the same specimens which Gronovius had described in his earliest publications, the *Museum Ichthyologicum* (1754–56) and the *Zoophylacium* (1763). Although both works were non-binominal, later authors had given valid names to many of the descriptions, and chief amongst these was Linnaeus, who in the tenth and twelfth editions of the *Systema Naturae* had named many species wholly or partly on references to these works. Many of these specimens are thus part of the type series of Linnaean species. When I found that only a few had ever been recognized as such, it became obvious that a careful study of the whole collection would have more than an historical value. It is, however, essential to know something of the background to an early and historical museum collection. Such details that I have been able to give of the life of Gronovius amount to the most full account of the man whom Gray (1854*a*) described as, " one of the best ichthyologists of the latter part of the last century ".

2. A BIOGRAPHICAL NOTE

Work on an early collection of any kind inevitably leads to a desire to know something of its history, and particularly something about the collector. In this case the standard works of reference are of little value, for Laurens Theodorus is usually eclipsed by the lengthy notes on his famous father, his grandfather (Jacob) and even earlier ancestors. Most authors merely list his published works and mention that he was a Dutch naturalist of the eighteenth century, of some civic importance in his native town of Leiden, and although primarily an ichthyologist, the author or editor of several works on general natural history.

Other sources are scarcely better and have mainly concentrated on the *Zoophylacium*. Whitley (1929) in drawing attention to the binary names of fishes that appeared in the index to that work, was interested mainly in the repercussions that their resurrection would have on nomenclature.[1] Higgins (1950) accepted Whitley's account of the history of this work, and added a few biographical details, which, however, prove to be a translation of Gronovius's public offices and honours as they appeared after the author's name on the title page of the *Zoophylacium*. He also noted that Laurens Gronovius " edited the 9th edition of the Systema " of Linnaeus, an undertaking for which the elder Gronovius was actually responsible. Finally, a major work on the history and the genealogy of the Gronovius family (Bijleveld, 1942) traces it from the early sixteenth to the beginning of the twentieth centuries, and this has been followed for the purposes of the present study.

Laurens Theodorus Gronovius was born in Leiden on the 1st of June, 1730, and, baptized in the Hooglandse Kerk three days later. He was the only son of Johan Frederic Gronovius (1686–1762), although the latter had two daughters by a previous marriage, one of whom had died before Laurens was born. The elder Gronovius was a man of some importance in his native town of Leiden, being successively Senator, Sheriff and Burgomaster of the city, and also a practising doctor of medicine. Although he is remembered chiefly as a botanist, the author of the *Flora Virginica* (1739–43) and the *Flora Orientalis* (1755), he published a number of papers of zoological interest. As a member of the small circle of Dutch and foreign students of natural history then gathered in Holland, he was on intimate terms with Linnaeus, Artedi, van Royen, Boerhaave, Lawson, Seba and others whose names are perhaps less well known to-day. His second wife, the mother of Laurens, was Johanna Susanna Alensoon (1698–1774) of Leiden.

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[1] They have since been declared unacceptable by the International Commission on Zoological Nomenclature (1950).

The younger Gronovius was admitted to the Academy at Leiden on the 20th of March, 1744, and seven years later his *Dissertatio juridica inauguralis* was published. It seems probable that between the completion of his studies and 1762 (nearly eleven years), when he became increasingly occupied with civic affairs, he spent much of his time studying his father's collections. His main interest was in zoology, and his published works are nearly all concerned with vertebrate animals, and particularly fishes. In 1754 he published the first fascicle of the *Museum Ichthyologicum* (fascicle II–1756), a work which clearly reflected his ability in this field, although his methods and classification owe much to the work of Artedi. Despite the fact that his father may have helped in the preparation of the work (although there is no evidence that he did so), it is noteworthy that when the first volume was published the author was only twenty-four years old.

In addition, during these eleven years (1751–62) Gronovius published the *Bibliotheca Regni animalis* . . . (1760), reissued and edited part of Seguier's *Bibliotheca Botanica* . . . (1760), and made several contributions to the *Uitgezogte Verhandlingen* and *Acta Helvetica*. He also translated into Dutch, Alexander Russell's *Natural History of Aleppo* which was published in Leiden in 1762. Gronovius had corresponded with Russell and had been sent specimens of the fishes found in the vicinity of Aleppo, which were described and figured in the first fascicle of the *Zoophylacium* (Wheeler, 1956*b*). This fascicle was published in 1763, and the second part a year later, but much of both fascicles must have been written before 1762. Although Gronovius was only thirty-three years old, this was almost the last publication of his lifetime. The *Record of the Royal Society* shows that he was elected a Fellow on the 10th of March, 1763 ; and he became a member of the Hollandsche Maatschappij der Wetenschappen te Haarlem on the 25th of May, 1762.

In that year his preoccupation with his father's collections came to an end, and unhappily this coincided with their becoming his property, for on the 14th of July, at the age of 76, his father died, and Laurens, the only son, inherited his library, collections and responsibilities. Three days later he succeeded his father as a member of the Council of Forty (Veertig-raad)[1]. The Council was chosen from the citizens of the town and was largely concerned with the administration of the community, and the making and enforcement of local laws. He held this position until his death.

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[1] The civic posts that Gronovius held I quote parenthetically in Dutch, for it is often difficult to interpret them into English equivalents, and indeed many of them have no counterpart in English local administration.

On the 31st of August, 1765, the banns of Gronovius's marriage to Anna Apollonia Verbeek were published, and on the 15th of September they were married at Zierikzee. They lived in Leiden in a house that had belonged to the family for some years ; it still stands in the Rappenburg opposite the buildings of the University. They had two children, Johannes, born the 4th of August, 1768, and Samuel Ulric, baptized in the Pieterskerk, Leiden, on the 2nd of December, 1772. The elder, a lawyer, went to the Dutch East Indies, where he died in 1822 ; his brother became the Dutch Ambassador at Baden, and died in Karlsruhe in 1810.

In 1767 Gronovius was elected to the College of Sheriffs (Schepen), which was in some ways the precursor of the modern town council. Four years later he was appointed (probably as treasurer), to the Waterschap, a group of prominent citizens responsible for the maintenance of the dykes. A year later he became a member of the council of the City Fathers (Vroedschap), and in 1773, Weesmeester, the regent or surveyor of the city's orphanages. The highest civic dignity that he attained was as a " Deputé de la Chambre des Comptes de la province de Hollande à la Hayé ", and as a member of the board which controlled the finances of the richest and most prosperous province of the country, he would have enjoyed considerable prestige.

In the year before he became a Deputé, however, both his wife and his mother died. His wife died on the 29th of January and his mother in December 1774 ; both were buried in the Pieterskerk in Leiden. Gronovius's last years were marked with tragic irony ; in 1773 his appointment as Weesmeester gave him charge over the orphanages of the province, and at the time, the possibility that his own sons would within four years be orphans, must have seemed very remote indeed. Yet, a year later, both their mother and grandmother had died, and on the 8th of August, 1777, at the age of 47, Gronovius died suddenly. He was buried beside his wife and parents in the family vault in the Pieterskerk, on the 15th of August.

Gronovius's death was probably as unexpected as it was sudden, for no trace of a will can be found, nor was there apparently any provision made for the guardianship of his sons. The famous Gronovius collections were on view in Leiden on the 1st and 2nd of October, 1778, and were offered for sale on the 7th and 8th of that month ; the library was sold on the 5th of October. It is possible that some of the more valuable of the mineral specimens, such as pearls and specimens of gold and silver, that were included in the manuscript *Lithophylacium*, were sold separately. A loose sheet of paper in that manuscript lists some of these substances, and against each is written a value in guilders. This may, however, be only a valuation for the purposes of the sale, for there are a number of precious metals listed in the sale catalogue.

As an example of the decline of his biological work with his increase in civic importance, the period from 1765 until his death is outstanding. During those years Gronovius published only two short papers in two journals, although his edition of the *Historiae Naturalis* of Plinius Secundus, which was published posthumously (1778) must have been almost complete, if not in the press, at the time of his death. Added to this, at his death, there were at least three unpublished manuscripts in varying stages of completion all of which have been preserved or published.

These were, the third fascicle of the *Zoophylacium* published by F. C. Meuschen[1] in 1781 ; the incomplete manuscript which Gray (1854) published, and a still unpublished manuscript, the *Lithophylacium*, a catalogue of the mineral specimens, fossils and other natural calcareous products in his collection. There were also two other manuscripts, which were mentioned by Boddaert in the letter of which a translation is given on p. 195. These have presumably perished.

There has been some confusion amongst authors as to the learned societies of which Gronovius was a member. This probably originated from the rather cryptic abbreviation of his personal titles which appear on the title page of the *Zoophylacium* —" Societatis Physico-Medicae Regiae Londinensis, Basilaeensis, atque Hollandicae Socius ". This has been freely translated (Higgins, 1950) into " member of several learned societies, including the Royal Physico-Medical Society of London ". It appears, however, that there has never been such a society in existence in London, although there was a Physico-Medical Society of London founded in 1771 (a copy of its rules, printed in 1774, is preserved in the British Museum), but this was eight years after Gronovius was using the title. This Society was not entitled to, and apparently never used the prefix Royal. The explanation lies in a less literal rendering than the above, and this gives the information that Gronovius was a Fellow of the Royal Society (of London), a member of the Physico-Medical Society of Basle, and the Dutch Society of Science at Haarlem. The Physico-Medical Society was founded in 1751 and a number of Gronovius's shorter publications were published in its journal, *Acta Helvetica*.

3. GRONOVIUS AND CONTEMPORARY ICHTHYOLOGY

It is not an easy matter to assess the influence that Gronovius had on the history of systematic ichthyology, but there can be little doubt that it was not great. It is, however, of interest to note that amongst his contemporaries at least he was held in some esteem. Linnaeus (1758 : 241) in his introduction to the section on fishes in the tenth edition of the *Systema*, ranked him as one of the " Ichthyologi Theoretici "; preceded only by Artedi and Linnaeus himself ! Another reference occurs in a letter written by Peter Collinson shortly after the publication of the *Museum Ichthyologicum*, to Linnaeus, (Smith, 1821). Collinson, a friend of the older Gronovius, wrote, " . . . young Gronovius, whom I much admire for dedicating his youth to useful knowledge."

Later authors were bound to take a more objective view, and Günther's assessment of Gronovius's influence, although seemingly severe, was nevertheless very near the truth. He wrote, " Two contemporaries of *Linnaeus* (Klein and Gronovius) attempted a systematic arrangement of fishes ; both had considerable opportunities for their study, especially in possessing extensive collections ; but neither exercised any influence on the progress of Ichthyology ". Detailed studies of the history of ichthyology have been given by a number of authors, so it is not necessary to enlarge on that subject here. The more ambitious accounts can be found in Cuvier & Valenciennes (1828), in Günther (1880) and in Jordan (1905), (the latter both owe an unacknowledged debt to the previous authors), and study of these will give a general idea of the role that Gronovius played in the history of the knowledge of fishes.

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[1] Frederic Christian Meuschen (1719–*ca.* 1800) was at one time Secretary to the Legation of Denmark and later to the Duke of Saxe-Coburg, at the Hague. He possessed a very fine collection of shells, and conchology was obviously his principal biological interest. He compiled many sale catalogues of zoological collections and at least ten are attributed to his authorship, including the catalogue of the Gronovius collection (1778) (Tomlin, 1942). A contemporary of Gronovius, it is very likely that they were familiar for both studied law at Leiden at the same period (Meuschen entered in 1742).

That Gronovius's work had so little lasting influence may seem rather surprising when one considers his undoubted ability in this field, and in view of the fact that his work usually exceeded that of his contemporaries in both volume and accuracy. Primarily, it may be attributed to the fact that he never attempted a complete account of the then known fishes, as for example, did Artedi (1738). Both his major works (the *Museum Ichthyologicum* and the *Zoophylacium*) were more concerned with description of specimens in the Gronovius collection than with a general account of fishes ; and although the latter work did take into account some species which were not represented, it was only in a very superficial manner. This is also true of the manuscript published by Gray in 1854, which, although Gray supplied the title, could have been no more aptly named than as a " *Catalogue of Fish collected and described by Laurence Theodore Gronow* . . . " Had the work which Boddaert described (p. 195) as a *Historia Naturalis Piscium* been completed and published by the author, it may possibly have made a greater mark on ichthyology than any of his other works. Secondarily, I think that Gronovius's slight influence on later systematists can be attributed to his failure to adopt binominal nomenclature until after the major part of his work had been published.[1]

On the credit side, however, Gronovius excelled in the description of his specimens. A number of recent authors have commented on the clarity and accuracy of the descriptions in both his major works, and have favourably compared them with those of his contemporaries. Moreover, Linnaeus based many of his names either partly or wholly on his diagnosis of species. There were, in fact, a total of one hundred and thirteen references to Gronovius in the Pisces and Amphibia Nantes sections of the tenth edition of the *Systema Naturae*. and in the twelfth edition this number increased to one hundred and twenty-five. These figures give some idea of the importance of Gronovius's contribution to the *Systema*, in the tenth edition of which some four hundred fish species were recognized.

With regard to the classification of fishes that Gronovius adopted it has already been pointed out that it closely followed that proposed by Artedi. In the *Museum Ichthyologicum* he followed this system closely in the four classes of fishes, Malacopterygii, Acanthopterygii, Branchiostegi and Chondropterygii, while the Plagiuri were placed in a group apart as being " piscis cauda horizontali." His genera were with eight additions all after Artedi. In the first fascicle of the *Zoophylacium*, however, there is evidence of some original thinking, and, in addition to increasing still further the number of known genera, Gronovius abandoned the distinction between Artedi's Malacopterygii and Acanthopterygii (which had been distinguished by " Pinnis inermibus " and Pinnis aculeatis " respectively), and replaced them by the class

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[1] None of the fishes described by Gronovius have been accepted as binominal, with the exception of those published in Gronovius (1772), and those in the manuscript published by Gray (1854).

Branchiales. In this arrangement the Chondropterygii remained unchanged and included lampreys, sharks, rays, chimaeras and sturgeons. The Branchiostegi, however, had been greatly expanded, and although formerly embracing only the plectognaths, *Cyclopterus* and *Lophius*, now included *Muraena*, *Gymnotus*, *Syngnathus* and *Gonorhynchus*. This heterogeneous collection was further divided by variations in the position of the pelvic fins.

The major class of fishes, Gronovius's Branchiales, was divided according to the position of the pelvic fins, and each division arranged by the number of dorsal fins. This arbitrary splitting inevitably produced some strange bed-fellows, for example *Callyodon*, *Pleuronectes*, *Echeneis* and *Blennius* all adjacent in the same subdivision of the Branchiales. This was, however, certainly no worse in this respect than the classification that Linnaeus proposed in 1758, where there were several innovations, not all of which appear to have been justified, such as the removal of the Pisces Chondropterygii to form a group (Nantes) of the Amphibia. With the exception of the Branchiostegi, the remainder of the Linnaean (tenth edition) system departed from Artedi's still further, and was divided according to the presence or position of the pelvic fins, to form the Apodes, Jugulares, Thoracici and Abdominales. Although the two systems of Linnaeus in 1758, and Gronovius in 1763, appear to be widely different, particularly in their terminology, they both relied to some extent on the same characters, and in fact, approach one another fairly closely. It is, I think, possible that the classification of Gronovius was a modification of that of Linnaeus.

4. THE GRONOVIUS FISHES BETWEEN 1778 AND 1853

Both the collection of fishes and the manuscript describing them were purchased at the sale rooms of a Mr. Phillips in Bond Street, London, but beyond this little is known of their history between the death of Gronovius and their reappearance in London nearly eighty years later. Gray (1854) mentions that the other lots at the auction consisted of " . . . Bronzes and other objects of Vertu, imported from Paris ", but from this somewhat ambiguous statement it is not clear if the collection was also brought from Paris for the sale. He did, however, give a few details (1854*a*) of the London sale, which for the sake of their general interest are quoted here :

> " A box of dry skins of fish arranged between sheets of cartridge paper like a collection of dry plants, said to be accompanied by a MS. description, was offered for public sale in a collection of objects of *vertu* in Bond Street.
>
> " At the time of the sale and while on view the MS. could not be found ; however, as a slight examination of the specimens showed they were a partially named collection of about the time of Gronov (better known by his Latinised name of Gronovius), who was, without doubt, one of the best ichthyologists of the latter part of the last century, and by a person who used the names which he had introduced, and I found there were sundry Dutch names on the specimens, and the paper of Dutch manufacture, I considered the collection even without the MS. would be an advantageous purchase.

> "The day after the sale the MS. was found and delivered, and I was much pleased to find it consisted of 120 separate sheets of gilt-edged quarto letter paper, containing the generic and specific characters and detailed descriptions of the new species in the collection, with a reference to their synonyma, illustrated with 84 similar sheets, consisting of original drawings of the more important species, some engravings extracted from Gronovius's 'Museum Ichthyologicum', and some of the original drawings from whence other figures in that work and the 'Gazophylacium' (*sic*) of the same author had been engraved."

From his remarks it is evident that in the period between the Gronovius sale (1778) and the auction in London, this part of the collection had completely lost its identity. This, as Gray surmised, indicated that it had come through the hands of persons who were neither naturalists nor interested in natural history. Further testimony supporting this opinion is not difficult to find. Gray referred to the numbers that had been written against each genus in the manuscript and on the sheets of the collection, and also to the generic names which were written on the sheets. He, quite correctly, observed that it was evident that both numbers and generic names were additions to the manuscript by a hand not the author's, and in one or two instances the names were incorrectly spelled. In addition, there are several errors in correlating the specimens with the descriptions by means of these generic names and the numbers; for instance, several widely different fishes were referred to the genus *Callorhynchus*. He also noted that from the appearance of both the box and the padlock fastening it (neither article has been preserved) it was doubtful if it had been more than cursorily examined since the death of the original owner. From all these points it can be concluded that the unknown owner (or owners) of the Gronovius fishes were not naturalists.

Although the fishes were included in the sale of the collection in 1778, they were not sold, and a letter dated 1791 (thirteen years after the death of Gronovius) shows that both the fish skins and the manuscripts relating to them were still in the possession of the sons and their guardians. This unpublished letter from Pieter Boddaert to Sir Joseph Banks, is of such interest in this connection that I quote a translation of the relevant portion of it, in full.

> Sir,
>
> M. van Dielen, a young nobleman of much merit is leaving for London with Mme. the Ambassadress and I take advantage of this to write to you to express my sincere regards; and what is more, to inform you that the young M. Gronovius and the guardians of his brother have offered me the manuscripts of their father, the late L. T. Gronovius for publication. I can not refuse this kind offer and the confidence these gentlemen have been pleased to put in my humble talents. It includes descriptions of about three hundred fishes with drawings in Chinese ink of most of them. But M. Gronovius died twelve years ago; and many of the books and observations of Mm. *Broussonet* as well as *Bloch*, *Gmelin*, ... and others, have been published and have enriched ichthyology, I will add these to the manuscript of M. Gronovius. There is still another manuscript containing

Insects which is nearly complete and which will serve as a supplement to the *Zoophylacium*. Therefore, Sir, I ask for your patronage for this work and the honour of dedicating it to you, as much in my own name as in that of my friend Johannes Gronovius. I beg you, Sir, to agree to my request. The work of as great a man as the late M. Gronovius, dedicated to a man of whom all Europe knows; the combination can surely not fail to succeed.

In order to complete these descriptions, M. Gronovius the son, has sent me about 500 very well preserved dried fishes, and since he has become interested in old coins (of which he has a wonderful collection) he has commissioned me to sell them in England (because here natural history is dead, and France is too much occupied with revolutions and other troubles). Therefore, if the British Museum, or some amateur, perhaps yourself, Sir, or maybe M. Latham, M. Smith or the owner of the cabinet of M. Ashton Levers, would like to buy them, they can have them for fifty guineas, with all the descriptions and illustrations, for which the late M. Gronovius paid three florins each. The other works left by M. L. T. Gronovius are notes for a *Philosophia Ichthyologicum* and a *Historia Naturalis Piscium* which I intend to publish. Perhaps Sir, you will inform me as to whether you will do me the honour of accepting the dedication or not. I will not fail to have the work produced as attractively as the others . . . If you wish to reply to this letter M. van Dielen is returning in three months and will willingly be the bearer of it. He counts it as a great honour to know personally the man whom the learned of Europe admire . . .

Finally, Sir, I end my letter by assuring you of my deepest respects and recommending my friend, I am

Sir,
Your very humble servant,
Boddaert.

Utrecht, the 6th August, 1791.

Unfortunately it has proved impossible to discover more than this tantalizing glimpse into the history of the fish collection between 1778 and 1853. I can find no record of Banks's answer to this first letter, although that he did reply is certain from the ensuing correspondence. In July 1793, Boddaert again wrote to Banks with news of the manuscript.

Sir,

I am taking the present opportunity to write you this letter, M. de Westreenen, Seigneur de Temaat is leaving for England accompanied by his wife, and they wish to be entrusted with my letter. I take the liberty, therefore, of recommending him as a very amiable man, who having completed his studies, made what is known as the Grand Tour, and after seeing Paris, Rome, Naples etc. came back to this country and applied himself to the study of Botany . . . We are, however, very poorly served in this Science and it is this ardour for Botany which has made him undertake the journey to England . . .

M. de Te-maat (*sic*) will also be carrying my manuscript of M. Gronovius's

> works on fish, of which you have kindly accepted the dedication. I thank you for the obliging letter . . . I would willingly accept your offers but my income is too limited for me to see London and its treasures, although there is still hope of paying you a visit. Three or four months ago, I wrote to Mr. Whyte, printer of London, about the publishing of my manuscript and added your obliging letter as recommendation, but up to the present I have received no reply. M. de Themaat (*sic*) is entrusted to show my work to him or to choose another printer who will take it ; it is up to him.
>
> The unfortunate war[1] we have in our country has caused the taste for natural history to fall off, and I shall have to resolve the trouble by having the work printed in your fortunate country where the sciences are flourishing . . .
>
> Boddaert
>
> Utrecht, 7th July, 1793.

Nor was this all, for in the next year (5th May, 1794) he wrote telling Banks that M. de Themaat had taken the manuscript to London, but had failed to find a publisher. The offer to sell the collection of dry fishes was never mentioned again, and it was not until sixty years later that approximately half of it came to the British Museum.

There is nothing further to add, save perhaps, to note that Boddaert died only two years after he wrote the last letter. In those troubled years he apparently never made his anticipated visit to London, nor succeeded in finding a publisher for the Gronovius manuscript.

In this context, however, it is of interest to mention the history of the only other part of the Gronovius collection that is known to be in existence to-day. In the Royal Library at the Hague there is an annotated copy of the rare sale catalogue of the Museum Gronovianum, and the notes are of interest in relation to the sale of the herbarium. At the foot of page forty-two, a note,[2] in an unknown Dutch hand, reads ;

> "The Herbarius Vivus whose principal value consisted of the Virginian plants that formed the basis of the *Flora Virginica* written by Dr. Jo. Fred. Gronovius with the assistance of Dr. Car. Linnaeus, of which plants a part was missing and possibly to be found at Vienna at Mr. Jacquin's, was bid up to 350 guilders by several bidders ; to 625 guilders by D. van Royen, a price exceeding the value in the opinion of all connoisseurs ; and was bought by the bookseller Bennet of Rotterdam on behalf of Lord Bute of London, at 650 guilders. The commission was practically unlimited."

To which, perhaps rather envious note, was added,

> "The bookseller told me that he regretted to stand in my way ; and afterwards when he had become the buyer, that he had a commission of £250–£300, and moreover need not stint a bagful of Dutch guilders."

---

[1] The Napoleonic Wars.

[2] During my own short visit to Holland I was unable to see the work in the Koninklyjke Bibliotheek at the Hague, and I am indebted to Dr. W. H. van Seters for the translation from the Dutch, and indeed for drawing my attention to this annotated copy of the *Museum Gronovianum* in the first place.

This passage, however, appears to contradict Murray's (1904) statement, for which he gave no authority, that " John, Earl of Bute, . . . bought it (the herbarium) for £90 in 1778 ".

The new owner of the herbarium was John Stuart, third Earl of Bute (1713–94), at the time of Gronovius's death a prominent political figure in England. He formed a famous collection of paintings, astronomical and mathematical instruments, and a vast botanic garden, from which presumably sprang his interest in the herbarium. His prints, part of his library and his natural history specimens were sold after his death, and at the sale Sir Joseph Banks purchased both the herbarium and part of the library. Eventually, after Banks's death the collection passed to the British Museum, and is now preserved in the general herbarium of the British Museum (Natural History). Part of the library of Gronovius evidently followed the same course as the plant collection, for in the library of the British Museum there is preserved a (Banksian) copy of Leonhart Rauwolf's (1583) travels, with a note on the flyleaf, " Exemplar hoc est qus usus est Johannes Fridericus Gronovius in adornanda Flora Orientalis quisque annotationes manu propri addidit ".

5. THE MANUSCRIPT

As neither the authorship of the manuscript nor the identity of the collection were known at the time of the sale in London, Gray listed several reasons why he ascribed it to Gronovius, although he had apparently little doubt that it was the Gronovius collection. His chief evidence was that several of the illustrations in the manuscript are the originals of figures in the *Museum Ichthyologicum*, the *Zoophylacium* and other illustrations of Gronovius's published works, but it should be added that the manuscript is written in the same hand as the manuscript *Lithophylacium*, which has the author's name on the title page, and as the Gronovius letters preserved by the Linnean Society of London.

The manuscript consists of one hundred and twenty separate sheets of quarto paper, together with eighty-five sheets of illustrations. Gray arranged the loose sheets in the order in which the work was published, and they are now bound with the illustrations (which were not published) inserted at the end of the genus to which they refer. The illustrations are the work of possibly six artists, three of whom have signed their drawings. The majority are by Isaac la Fargue van Nieuwland (1726–1805), whose signature appears on nineteen of them, and to whom I ascribe a further thirty-two ; there are also three others which may be his work. The signature J. J. Bylaert appears on two plates ; one, a pencil sketch, and the other a fine sepia chalk drawing (Plate 27) of the *Raja rhinobatus* of the manuscript (1854 : 10). Four more of the illustrations are in the same medium, and as their style closely resembles that of the above I assume that these also are the work of Bylaert. There are in addition three pencil sketches which are probably his work. The third illustrator was A. Delfos whose signature appears on the original of one of the figures of *Scorpaena monstrosa* Gronovius 1854 published in the *Zoophylacium* (tab. 11, fig. 1) ; the other two drawings of this fish are obviously by the same hand. There is a possibility that he is also the author of four other unsigned drawings. There are sixteen illustrations which are the work of possibly three other unknown artists. Eleven of the total of eighty-five illustrations are " engravings extracted from the published works of the author " and these, probably cut from a copy of the *Zoophylacium*, are mounted on the same gilt-edged, quarto paper as the remainder of the manuscript. I have already commented (Wheeler, 1956) on Gronovius's habit of reproducing the figures of his earlier works to illustrate his later ones, and he obviously intended to follow this course with the manuscript if it had been published.

The earliest artist working for Gronovius was probably Abraham Delfos. Several of the plates in the *Museum Ichthyologicum* (I–III), the *Zoophylacium* (XI–XIII) were his work, as was the figure accompanying the description of *Cyclogaster liparis* in *Acta Helvetica* (1760). An unpublished drawing by Bylaert is dated 1768, and he contributed at least one of the figures to the *Zoophylacium* (pl. IX) and probably several more. To some extent these dates limit the period in which the manuscript was written ; Gray (1854*a*) assumed that it was prepared between 1774 and 1777, and fixed the earlier date as several of the van Nieuwland drawings are dated 1774, although he also mentioned the one signed " J. J. Byland (Bylaert,) 1768 ". I am inclined to agree with this opinion, but as the manuscript was largely an extension and revision of the first fascicle of the *Zoophylacium*, it is quite possible that Gronovius began compiling it shortly after the completion of that work. To rely entirely on the dates of the illustrations may, however, give a false impression, as there is no guarantee that the artist was working at the same time as the author. Indeed in the case of van Nieuwland, who normally resided at the Hague, it is quite probable that all his drawings were executed during 1774 (the date on a number of them) when he was living in Leiden. It was during this period that he painted the portrait of Gronovius which now hangs in the Lakenhal Museum, in Leiden (Pl. 26). It would be interesting to know for certain, as seems likely, if he was the artist whose work was that " for which the late M. Gronovius paid three florins each ".

From internal evidence we can be fairly sure that the manuscript was commenced between 1766 and 1772, and that parts of it were not written until as late as 1775, although the fact that the descriptions of several genera (*Mystus* and *Dascillus* for example) were never finished, show that it was still incomplete at the time of his death. Several fishes still preserved in the collection which were not mentioned in the manuscript, may be another indication of its unfinished state. The reason for giving the later date as 1772, is that in that year Gronovius published a note on several fishes, amongst them a *Calloryncbus americanus*, and in the description of it he referred to two other species of that genus—*C. atlanticus* and *Calloryncho elephantino*. Although neither name is valid as of that date they were again used in the manuscript when they were reinforced with adequate descriptions. This is, I think, adequate proof that this part of the manuscript was already written at that time. That the author wrote part of it after 1775 is conclusively proved by the reference in the synonymy *Muraena myrus* (1854 : 20), to *Muraena cinerea* Forskål. This name was given to a species described in Forskål's *Descriptiones Animalium* (: 22, n. 2), which was not published until 1775. The many references to the twelfth edition of the *Systema Naturae* in the synonymies of different species indicate that it was not begun until that work had been published in 1766, for these references are obviously contemporary, and are not additions to an existing text.

To summarize the evidence relating to the date of the manuscript, it is very likely that it was begun shortly after 1766, and certainly was in preparation before 1772, and continued in this state until the author's death in 1777. The dates of the illustrations to some extent verify this conclusion for two are dated 1768 and the majority 1774.

6. THE COLLECTION OF FISHES

One characteristic of the collection which has never failed to attract attention, is its method of preservation, dry and " arranged between sheets of cartridge paper like a collection of dry plants " (Gray, 1854*a*). This method of preserving the skins was very successful and the specimens are, in general, in a much better state of preservation than many dried skins and stuffed specimens collected a century later. Fortunnately we know the details of the method used to preserve these specimens, for on the 4th of March, 1742, Peter Collinson read to the Royal Society a communication on " *A* Method *of preparing* Specimens *of* Fish, *by drying their* Skins, *as practised by* John Frid. Gronovius[1] *M.D. at* Leyden ", which was later printed in the *Philosophical Transactions* (1744). This note is fully reproduced.

> " *There are requisite for this Purpose.*
>
> A Pair of Scissars, with very fine Blades, and sharp Points.
> Small wooden Plates (of the Lime-tree, or wooden Trenchers).
> A very fine Needle.
> Slips of Parchment as large as the Fishes.
> Minnikin Pins, or small Pins.
>
> " Take hold of the Fish with your Left Hand, so as that the Belly may be towards the Hollow of your Hand, and its Head pointed to your Breast. Then with the Needle make a Wound behind its Head, into which introduce one of the Points of your Scissars, cutting gently from thence along to the Tail. If you would preserve the Right Side, the Scissars are to be conducted on the Left Side of the Fins. This being done from the Head to the Tail, the Scissars are to be pointed deeper, and the Flesh divided quite to the Back-bone. Then turn the Fish with its Back downwards, and its Belly upwards, and proceed in the same manner, cutting with the Scissars through both the Head and Jaws. Take away the Brain and Gills. The Fish then easily parts, the Intestines appear, which may be easily taken away. The Back-bones are then cut assunder, the Fish is to be washed, rubbed till it is dry with a Linen Cloth, and placed upon a Board, in such a manner as that the Skin, covered with its Scales, may lie uppermost, and all the Fins and Tail are to be expanded with Pins. Let it then be exposed to the Sun, if in Summer, or, if in Winter, to the Fire, till the Skin grows quite dry and hard, when it must be turned, and the Flesh exposed to the Sun or Fire, till it is also dry ; and then the Skin may be separated from the Flesh with very little Trouble, and, being put betwixt Papers, must be pressed flat. But as a sort of glutinous Matter, in pressing, is always forced out from betwixt

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[1] Günther (1880) and other authors, have erroneously credited the younger Gronovius " with the invention of preparing flat skins of fishes in a dry state and preserving them in the manner of an herbarium ".

> the Scales and the Skin, a Piece of Parchment is to be laid under the Fish, which is easily separated from the Scales, but Paper always sticks : for this Reason it is necessary, that after an Hour or two, a fresh Piece of Parchment should be applied : And thus, in the Space of 24 Hours, the Fish is prepared."

Even this account, full as it is, was further amplified by J. F. Gronovius when writing to John Bartram in America ;

> " I sent at this occasion to you a few specimens of dryed fishes, to be kept as plants in an Herbarius ; the great misfortune is, that the colour perish, else it shows a good way to find out the characters 1. by nummer of the bones in the membrana branchiostega, which you see in the flying Trigla marked with blak ; 2. by the nummer and position of the Fins, and the bones in them. 3. by the Course of the linea lateralis running in each fish from the blak (back ?) part of the head to the tail. *Hebenstreit*[1] a professor at Leipsich hath invented this methode, but he never would communicate the way to prepare them so ; till at last I found it out a few years ago . . . ".

There is little doubt that most of the specimens in the collection are preserved by this method, and some of the skins bear small holes and show signs of stress where the " Minikin pins " had stretched them in drying. There were, however, other methods of preservation used, for the portrait of L. T. Gronovius (Pl. 26) shows animals preserved in bottles (probably of spirits of wine). Although preservation in spirit was accompanied by greater risks than any other method, it was more commonly used at this time than is generally realised to-day.

There appears to have been some variation in the preservation of the skins, for some are coated with a thin, still almost transparent varnish, while others have a very thick inferior coating, a difference due, no doubt, to their varying origins. The skins sent by Alexander Garden to Gronovius (and to Linnaeus), were prepared in America, and mounted on paper in Europe, for the collector had written a serial number in ink on each skin—and this obviously could only have been done to dry specimens.

While discussing the subject of the preservation of the collection it is interesting to refer to another letter that the elder Gronovius wrote to Bartram, dated Leyden, 2nd July, 1746, which reads,

> " . . . all things you send to me come very well over, except the two fishes, which were spoiled. I take therefore the liberty to communicate to you two prescriptions, of which one is a varnish that preserves the fishes, and any other thing, in a great perfection, *viz* :
>
> Gumm Copal ℥iij
> Masticheѕ
> Sandarach ā ℥ij
> Spirit. vini rectificantes lb. ijss
> M. lege artis.

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[1] Johan Ernst Hebenstreit travelled in Africa, and returned with a large collection in 1735, when he was elected Professor at Leipzig, where he died 5th December, 1757.

"The other is a powder, by which any creature, as quadrupeds and birds, are preserved and become very hard. I have several times made the experiment with a fowl, larger than a duck, putting him, with his excrementae and all, into a box, which is well closed, and putting this dose of a powder all over it : when the creature becomes in a few weeks very hard.

Pulv. aloes ℥iij
Myrrhae ℥ij
Sulphur
Alumin. ā ℥j
M. f. pulvis.[1]

"I don't doubt it will do very well with the fishes, without taking the intestines out of them, except that they may not be too thick ; then the intestines must be careful (by a gentle hole, made in the mid of the belly) taken out."

The whole collection of fish skins was mounted on folio sheets of good quality paper with usually one specimen, sometimes more, depending on their size, fastened to each sheet. Some sheets bear the name given to the specimens in the manuscript, and probably all were so named. Unfortunately Gronovius wrote in pencil in the bottom left hand corner of the sheet, and the dust, and rubbing against the sides of the original box had combined to obliterate many of these names, when Gray wrote in 1854. The subsequent treatment of the collection has aggravated this defect. In addition to these, many generic and Dutch vernacular names, and serial generic numbers (mentioned earlier) have been added by an unknown hand (one suspects Boddaert). The register number of this Museum has been added to the sheet since its acquisition and Günther wrote his identification under each specimen. It is to be regretted that several specimens have been cut out of their sheets in the last fifty years, an action which although it may have made the specimen more easily examined, has for certain, resulted in the destruction of several of the original names written by Gronovius, and has disrupted the continuity of the collection.

7. CONTRIBUTORS TO THE GENERAL COLLECTION

Unfortunately we have little knowledge of the way the collections were built up, but it has already been pointed out that they were the work of both father and son, a fact that appears to have escaped general notice. As I have pointed out elsewhere (Wheeler, 1955) a large part of it was acquired as gifts from various naturalists in

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[1] These formulae translate as follows :

Copal	3 apothecaries' ounces (30 grms.).
Mastic Sandarac	Of each 2 apothecaries' ounces (20 grms.).
Rectified spirits of wine (90% ethyl alcohol)	2½ apothecaries' pounds (350 cc.).

Mix according to the law of the art.

Powdered aloes	3 apothecaries' ounces.
Myrrh	2 apothecaries' ounces.
Sulphur Alum	Of each 1 apothecaries' ounce.

Mix to form a powder.

foreign lands with whom they were in correspondence. This was, of course, the manner in which the famous collection of Clayton's Virginian plants came into the possession of the elder Gronovius, and his correspondence with other American naturalists contains many references to sending specimens or addressing packets.

Another collector, this time an Englishman whose main interest was in mineralogical specimens, was William Borlase, author of *The Natural History of Cornwall* (1758). His name occurs very frequently against various minerals in the manuscript *Lithophylacium*, and possibly he sent the Cornish specimens listed by J. F. Gronovius in his *Index Lapideae* . . . (1740). Borlase had evidently sent a considerable collection to Leiden, and he mentioned this correspondence with the elder Gronovius in the preface to his work. The *Lithophlyacium* also contains the names of many persons who enriched the Gronovius cabinet with other gifts, and here Bartram, Neese and Jacquin are frequently mentioned ; Scopoli, Meuschen, Poda, Brunnich, Gmelin and Pennant occur less frequently. Similarly, the *Zoophylacium* also contains the names of many donors of specimens and in the first fascicle we find the names of Luyx Massis, Arnold Vosmaer, Johannis Ammani, Cornelius van Hoey, Wilhelm Kramer, Alexander Russell and Johan d'Annone.

Of those mentioned we need only concern ourselves particularly with two, both of whom presented a number of specimens of fish still preserved. Daniel Luyx Massis (to whom as " Amicorum optimo ", the second fascicle of the *Zoophylacium* was dedicated), obtained many of his specimens " from the Governors of the India Company, Surinam etc." (Index to the State Archives at the Hague.) He was a director of the West India Company. The second, Arnold Vosmaer, was the owner of a large collection purchased in 1766 by the widow of Prince William IV, which formed the basis of the cabinet of the Stadholders. Vosmaer was appointed director of the cabinet and its adjacent menagerie (Engel, 1939).

The period in which the collection was made (which I regard as taking about forty years i.e. *circa* 1737–77), coincided with a peak of Dutch colonial expansion, and specimens were probably collected and brought back by the crews of the sailing ships, perhaps at the special request of Gronovius, or maybe, only for sale to the curious. Certainly, this is the impression given by J. F. Gronovius, who wrote to Cadwallader Colden (6th August, 1743).

> " I get by our men of war an immense collection of natural things, of which my chiefest delight is in the Lapides and Testacea . . . "

One can be sure that of the specimens collected by the crews of " our men of war " fishes would be in a high proportion.

8. SYSTEMATIC CATALOGUE

In this catalogue of the Gronovius fishes, all the skins preserved in this Museum have been identified so far as their state of preservation will allow. Under each name are given the references to works in which Gronovius described the specimen, and also the name he applied to it in the manuscript published by Gray (1854). The entry concludes with the register number of this Museum and a note of the standard length on the skin. In the Marsipobranchii, Selachii, and Apodes, however, the length given is the total length. In a number of cases where these specimens are the sole types of an early described species, a short description of the skin has been given. As far as possible these descriptions have been drawn up using the methods adopted by recent workers on the group, but this has not been possible in all cases. A list of measurements of various parts of the specimen precedes these descriptions, and the figures in parentheses following these measurements represent that length as a percentage of the standard length; it should be stressed, however, that in measuring dry material a certain inaccuracy must be taken into consideration. This is primarily caused by the shrinkage of the skin on drying.

MARSIPOBRANCHII

PETROMYZONIDAE

Lampetra fluviatilis (L.), 1758

Mus. Ichth. **1** : 64, 144. *Zoophyl.* **1** : 38, 159.
Petromyzon fluviatilis, Gronovius (Gray), 1854 : 2.
1853.11.12.209. 149 mm.

Lampetra planeri (Bloch), 1784

Zoophyl. **1** : 38, 160.
Petromyzon branchialis L., Gronovius (Gray), 1854 : 2.
1853.11.12.208. 147 mm.

SELACHII

PLEUROTREMATA

ORECTOLOBIDAE

Chiloscyllium indicum (Gmelin), 1788

Mus. Ichth. **1** : 61, 133. *Zoophyl.* **1** : 34, 150.
Squalus caudatus Gronovius (Gray), 1854 : 8. Holotype.

As Gmelin (1788) based the name *Squalus indicus* solely on the description in the *Zoophylacium* this specimen must be regarded as the holotype of that species. This is also the case with Shaw's (1804) name *Squalus gronovianus*.

In the description in the *Museum Ichthyologicum* the statement " pinna ani nulla " has led to much confusion, causing Günther (1870) to state that " the anal fin is cut away ". Regan (1908), however, pointed out, " it is true that the species was described by Gronov as lacking an anal fin, but this was because he made the very natural mistake of regarding the anal fin as part of the caudal, as is evident from his description (1854) : ' Lobis qui subtus caudam occupant bini lineares, longi, aequales convexi '."

1853.11.12.205. 274 mm.

Snout to eye	16 (6)	Space between second dorsal and caudal	43 (16)
,, ,, first dorsal	105 (38)	First dorsal base	10 (4)
,, ,, second dorsal	156 (57)	Second dorsal base	11 (4)
,, ,, pectoral origin	39 (14)	Front edge of first dorsal	16 (6)
,, ,, pelvic origin	79 (29)	,, ,, ,, second dorsal	14 (5)
,, ,, anal origin	190 (70)	Body depth behind first dorsal	17 (6)
,, ,, upper caudal origin	212 (78)		
Space between dorsals	36 (13)		

This skin of a small female is much shrunk, particularly anterior to the pelvic fins, which has made accurate measurement very difficult. Examination of the teeth is also very difficult as the jaws have shrunk inwards and less than half of each jaw remains.

Head approximately 7·5 times in total length of the body, mouth ventral. Pectoral relatively large, its length almost equal to the head length. Body long and slender, tapering posteriorly. First dorsal fin placed well back, about its own basal length behind the pelvic fins ; the fin is small, rather higher than long, with a rounded upper angle, and a rather rectangular lower angle, and both the margins apparently slightly convex. The second dorsal fin is similar in shape and size to the first, but is slightly less high. The upper lobe of the caudal fin is much reduced and rises above the middle of the base of the anal fin, but at the tip of the tail it is expanded to nearly the same height as the lower lobe. The anterior lower lobe of the caudal is relatively long and low, and is a little less than the head length. The anal fin lies immediately before the anterior lower caudal lobe and is almost exactly of the same dimensions.

Colour : The skin is now largely a uniform dark brown ; anterior to the pelvic fins no colour pattern can be distinguished. Below the first dorsal, however, there are two vertical, irregular darker lines nearly as far apart as the base of the fin, and posterior to this a number of similar markings can be distinguished. Above the anal fin the marks are more distinct and there are six dark bands from the origin of the anal fin to the tip of the caudal fin, and a dark spot in the area of the last vertebrae.

CARCHARINIDAE

Carcharinus longimanus (Poey), 1861

Zoophyl. **1** : 32, 143.
Squalus carcharias (*non* L.), Gronovius (Gray), 1854 : 5.

The description in the *Museum Ichthyologicum* (**1** : 63,138) may also refer to this specimen, although there it is stated that a whole young fish, presented by Luyx Massis, was described.

1853.11.12.204. 400 mm.

Mustelus mustelus (L.), 1758

Mus. Ichth. **1** : 62, 135. *Zoophyl.* **1** : 31, 142.
Squalus mustelus, Gronovius (Gray), 1854 : 4.
1853.11.12.203. 290 mm.

SQUALIDAE

Squalus acanthias L., 1758

Mus. Ichth. ~~**1**~~ : 61, 134. *Zoophyl.* **1** : 34, 149.
Squalus acanthias, Gronovius (Gray), 1854 : 8.
1853.11.12.206. 225 mm.

SQUATINIDAE

Squatina squatina (L.), 1758

Zoophyl. **1** : 34, 151.
Squatina angelus Gronovius (Gray), 1854 : 14. Holotype.

The use of the specific name *angelus* in the manuscript, appears to have been independent of its use by de Blainville (1825), forty-eight years after Gronovius's death.

1853.11.12.207. 251 mm.

HYPOTREMATA

Torpedinidae

Dasyatis pastinaca (L.), 1758

Mus. Ichth. **1** : 64, 141. *Zoophyl.* **1** : 37, 158.
Pastinaca laevis Gronovius (Gray), 1854 : 11. Holotype.
1853.11.12.200. 400 mm.

Narke capensis (Gmelin), 1788

Zoophyl. **1** : 35, 152, " Habitat ad promontorium Bonae Spei ".
Torpedo capensis (*non* Gmelin) Gronovius (Gray), 1854 : 13. Holotype.

The description in the *Zoophylacium* is the only reference given by Gmelin (1788 : 1512), this specimen is thus the holotype of his *Raja capensis*.

1853.11.12.202. 235 mm.

Disc width	132	(56)	Snout to first dorsal	174	(74)
,, length	127	(55)	Base of first dorsal	11	(5)
Snout to eye	22	(9)	Height of first dorsal	14	(6)
Interorbital width	15	(6)	Space between first dorsal and caudal base	12	(5·5)
Diameter of orbit	3·5	(1·5)			
Diameter of spiracle	6·5	(3)			

The skin of this specimen is thin and shrivelled and exact measurement is very difficult. The whole of the ventral surface has been cut away, with the exception of the area around the pelvic fins. The presence of small claspers shows this individual to have been a young male.

The disc is practically circular, but with a slight lateral compression, its width being only slightly less than its length, and 56% of the total length. The tail length is equal to the length of the disc minus the snout. The snout, measured from the anterior edge of the orbit is 1·4 times the interorbital width, which is 4·3 times the diameter of the orbit. The spiracles are large, almost twice the diameter of the orbit with the edges slightly crenulate.

The dorsal fin rises well behind the pelvics, its base is only slightly less than the interspace between the dorsal and the origin of the caudal, and 1·3 in its height. The anterior profile of the fin is strongly convex, with a rectangular hind angle. The origin of the upper lobe of the caudal fin is slightly posterior to the lower lobe ; which is the least developed.

The colour is a dark sandy brown around the edges of the disc and along the sides of the trunk, while the median portion of the disc and trunk are a much darker brown. Both the dorsal and the caudal fins are dark brown and the edges of the spiracles are black. The claspers and the adjacent portion of the pelvic fins are lighter, almost yellow.

Raiidae

Raja montagui Fowler, 1910

Mus. Ichth. **1** : 64, 142. *Zoophyl.* **1** : 36, 155.
Raja miraletus L., Gronovius (Gray), 1854 : 9.
1853.11.12.197. Disc length 120 mm.

Raja clavata L., 1758

Mus. Ichth. **1** : 63, 140. *Zoophyl.* **1** : 36, 154.
Raja clavata, Gronovius (Gray), 1854 : 9.
1853.11.12.198. Dorsal surface, disc length 81 mm.
1853.11.12.199. Ventral surface, disc length 75 mm.

Raja clavata L., 1758

Zoophyl. **1** : 37, 157.
Raja leiobatos Gronovius (Gray), 1854 : 10. Holotype.
1853.11.12.201. Disc length 155 mm.

OSTEICHTHYS

Acipenseridae

Acipenser sturio L., 1758

Mus. Ichth. **1** : 60, 131 ; **2** : 42. *Zoophyl.* **1** : 30, 140.
Acipenser sturio, Gronovius (Gray), 1854 : 3.

The first description was probably compiled from earlier works, but in the second fascicle of the *Museum Ichthyologicum* there is a very full account including anatomical details. This description was referred to by Linnaeus, and the present specimen may thus be part of the original type material, although it would seem more likely that the specimen so fully described by Gronovius was larger than the present very small individual.

1853.11.12.210. 496 mm.

PISCES

ISOSPONDYLI

Clupeidae

Brevoortia tyrannus (Latrobe), 1802

Clupea carolinensis Gronovius (Gray), 1854 : 140. Holotype.

This specimen has an ink " No. 16 " on its side, and was part of Alexander Garden's collection from Carolina.

1853.11.12.109. 101 mm.

Clupea harengus L., 1758

Mus. Ichth. **1** : 5, 21. *Zoophyl.* **1** : 111, 348.
Clupea harengus, Gronovius (Gray), 1854 : 139.

In the *Museum Ichthyologicum* Gronovius distinguished between two unnamed varieties (" a " and " b ") of this species. They were characterized by " a " having eight rays in the ventral fin and sixteen in the anal, while " b " had nine ventral rays and only ten in the anal. The low anal count of the second variety is well outside the normal variation of the species, and Gronovius's specimen must have been either a teratological condition or damaged. Examination of the anal fin of the larger of these specimens shows it to have only ten rays, and there is every indication that the posterior rays have been damaged. For this reason I regard this specimen as being the one from which Gronovius drew up his description. The smaller specimen agrees very well in fin ray counts, with the specimen from which he described his variety " b ".

The name *Clupea harengus* was based by Linnaeus on a specimen in his own collection, and on descriptions by Gronovius (variety " a "), and Artedi (1738, **3** : 31). The smaller specimen is therefore probably part of the type material of this species.

1853.11.12.111.	185 mm.
1853.11.12.112.	236 mm.

Alosa alosa (L.), 1758

Mus. Ichth. **1** : 6, 23. *Zoophyl.* **1** : 111, 347.
Clupea alosa, Gronovius (Gray), 1854 : 139.

Gronovius (1754) recognized two varieties of this species ; one with twenty anal rays and eight pelvic rays, and the other with seventeen anal rays and seven pelvic rays. Linnaeus (1758) specifically indicated that the Gronovius specimen he recognized as *Clupea alosa* had twenty anal rays (D.18. P. . . . V.8. A.20. C. . . .); he named the species from a specimen in his own collection, and by reference to descriptions by Artedi (1738, 3 : 34), Gronovius and Hasselquist (1757 : 388).

Of the present specimens the smaller seems to have been utilised by Gronovius in his description, for the counts of fin rays recently made on this specimen agree exactly with those published. This specimen is therefore probably part of the type series. The larger specimen has seventeen rays in the anal fin, and I suspect that this low number may be due to damage in the preparation of the specimen.

1853.11.12.179.	155 mm.
1853.11.12.180.	306 mm.

SALMONIDAE

Thymallus thymallus (L.), 1758

Mus. Ichth. **2** : 12, 162, " Inhabitat Rhenum propre Basileam ". *Zoophyl.* **1** : 122, 375.
Salmo thymallus, Gronovius (Gray), 1854 : 153.

The name *Salmo thymallus* was based by Linnaeus on three earlier descriptions ; one by Artedi (1738, **3** : 41), his own description in the *Fauna Svecica* (1746 : 314) and to the *Museum Ichthyologicum* (although the number quoted in his reference is incorrect.) Neither Artedi's nor Linnaeus's specimens appear to be extant, and this present specimen is probably the only remaining part of the type series.

1853.11.12.159.	139 mm.

Coregonus oxyrinchus (L.), 1758

Mus. Ichth. **1** : 18, 48. *Zoophyl.* **1** : 122, 374.
Salmo oxyrhynchus, Gronovius (Gray), 1854 : 152.

Linnaeus based this name on two descriptions by previous authors, Artedi (1738, **3** : 37), and Gronovius. The fin ray counts given by Gronovius agree very well with those made on this specimen, and it may therefore be regarded as part of the type series.

1853.11.12.160. 343 mm.

GONORHYNCHIDAE

Gonorynchus gonorhynchus (L.), 1766 Plate 28, fig. 2.

Zoophyl. **1** : 55, 199, tab. 10, fig. 2.
Cobitis gonorhynchus, Gronovius (Gray), 1854 : 41, " Patria. Promontorium Bonae Spei ".

Linnaeus based his name *Cyprinus gonorhynchus* solely on the reference to the *Zoophylacium* and this specimen is therefore the holotype of the species.

1853.11.12.120. 187 mm.

Head length	32 (17)	Diameter of orbit	8 (4)
Snout to pectoral base	38 (20)	Body depth at pectoral	20 (10)
,, ,, pelvic base	125 (66)	,, ,, ,, dorsal	18 (9)
,, ,, dorsal fin	132 (70)	Base length of dorsal	14 (7)
,, ,, anal base	159 (84)	,, ,, ,, anal	11 (6)
,, ,, orbit	13 (7)	Depth of caudal peduncle	10 (5·5)

Dorsal 13. Anal 9. Pelvic 9. Pectoral 11.

Body slender, tapering, covered with many rows of small ctenoid scales, head also scaled with pointed snout and ventral mouth. Head length about six in the standard length ; snout 2·5 times in head : orbit[1] about four in head. Dorsal fin origin in the last third of body, rising immediately posterior to the pelvic fins. Of the thirteen dorsal fin rays, the first two are very short and inconspicuous, and the longest ray a little greater than the dorsal base, which is 2·3 times in the head. Origin of the anal fin midway between the origin of the dorsal and the caudal. There are approximately 163 rows of scales between the upper edge of the operculum and the origin of the caudal rays ; 19 rows above the lateral line to the base of the dorsal and 12 below to the pelvic base.

The colour is almost a uniform golden-brown, but lighter ventrally than above. There is a suggestion of a dark patch on the snout, and on the edge of the operculum. The membranes of the upper pectoral fin rays, the pelvic fin, the upper dorsal fin and parts of the caudal fin are dark, but the forepart of the anal fin, the hind edge of the dorsal and the tips of both caudal lobes are conspicuously lighter.

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[1] In life the eyes of these fishes are covered with a thick layer of skin and in the preparation of this specimen most of the bony orbit has been removed, consequently it is difficult to make an accurate measurement.

HAPLOMI

UMBRIDAE

Umbra krameri Walbaum, 1792

Zoophyl. **1** : 114, 355, " Habitat in Danubio ".
Umbra lucifuga Gronovius (Gray), 1854 : 143. Holotype.

It is worth noting that the name *Umbra catulus* proposed by Meuschen in the *Museum Gronovianum* (1778), antedates the name applied by Walbaum, although it is not now available for use (Opinion 260). The skin is badly damaged, the whole of the mid-part of the body being missing.

1853.11.12.98.	87 mm.

ESOCIDAE

Esox lucius L., 1758

Mus. Ichth. **1** : 9, 28. *Zoophyl.* **1** : 117, 361.
Esox lucius, Gronovius (Gray), 1854 : 146.

Linnaeus quoted only two references under this name, the first was to a description by Artedi (1738, 3 : 53), the second to Gronovius. This specimen should therefore be regarded as part of the type series.

1853.11.12.114.	165 mm.

INIOMI

SUDIDAE

Paralepis sp.

There appears to be no reference to this specimen in the manuscript published by Gray (1854). The specimen bears the figure 8 in the top right corner of the sheet on which it is mounted, but in the manuscript this refers to the genus *Callorhynchus*. The specimen is rather distorted but bears some resemblance to a specimen of *Paralepis speciosus* of comparable size. The right side of the head is also preserved on the same sheet.

1853.11.12.216.	85 mm.

GASTEROPELECIDAE

Gasteropelecus sternicla (L.), 1758 Plate 29, fig. 3.

Mus. Ichth. **2** : 7, 155, tab. 7, fig. 5. *Zoophyl.* **1** : 135, 409.
Gasteropelecus sternicla, Gronovius (Gray), 1854 : 171.

Linnaeus based his *Clupea sternicla* on two specimens, one of which was in his private collection, for he gave fin ray counts and a brief diagnosis but made no reference to any published work. The description in the *Museum Ichthyologicum* was also referred to, and thus this specimen has type status. Günther (1864 : 343) claimed this as the type of the species, and Fraser-Brunner (1950) mentioned " the type from Surinam ", but neither author apparently considered the status of the Linnaean specimen, although neither Günther (1899) nor Lonnberg (1896) list the specimen in the recognized Linnaean type material.

Gronovius failed to notice the adipose fin on his specimen, and he neither figured it nor mentioned it in his description, and at first sight I considered that it belonged to a genus lacking this fin (e.g. *Carnegiella*) but after careful examination it can be distinguished adhering to the back of the skin, and concealed by the varnish.

1853.11.12.211. 41 mm.

Head length	10·5	(25)	Depth of caudal peduncle	4	(10)
Snout to orbit	2·5	(6)	Last dorsal ray to caudal origin	9·5	(23)
,, ,, dorsal origin	29	(71)	Length of pectoral fin	20	(49)
,, ,, anal origin	28·5	(69)	,, ,, dorsal base	4	(10)
Diameter of orbit	3	(7)	,, ,, anal base	12	(29)
Greatest depth of body	20	(49)			

Dorsal 11. Anal 28.[1] Pectoral 11.

Body deep, greatly compressed laterally, and covered with conspicuous scales; head small, about four in standard length, snout 4–5 times in head. Dorsal fin short and not high, origin in last third of body, anal long, origin almost beneath dorsal fin. There are 33 scales in a longitudinal series from the upper edge of the operculum to the caudal origin. (This number fails to agree with the 28 given for this species by Fraser-Brunner.) In the series running from the origin of the anal fin to just behind the dorsal base there are 13 scales. Predorsal scales 22.

The mandible bears a single row of 7 tricuspid teeth, while there are 10 tricuspid teeth in the premaxillary but only 2 maxillary teeth.

The colour is a uniform brown. The upper two rays of the pectoral fin appear to be darker than the rest of the rays. Most of the scales on the thoracic keel are missing which makes it impossible to describe any markings on the keel, while the pectoral fin covers the area of the lateral band, if present. The scales above the anal fin still retain their striking iridescence.

GYMNOTIDAE

Sternopygus carapus (L.), 1758

Mus. Ichth. **1** : 29, 72, "Vivit in Surinamae Brasiliaeque fluminibus". *Zoophyl.* **1** : 41, 168.

Gymnotus carapo, Gronovius (Gray), 1854 : 22.

The description in the *Museum Ichthyologicum* gave the length of the specimen described as 16·75 inches, and this is almost the exact length of the larger of these two specimens.

1853.11.12.172.	*ca.* 180 mm.
1853.11.12.173.	*ca.* 438 mm.

CYPRINIDAE

Leuciscus leuciscus (L.), 1758

Zoophyl. **1** : 106, 337.

Cyprinus salax Gronovius (Gray), 1854 : 186. Holotype.

1853.11.12.157. 217 mm.

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[1] There is a gap in the fin where I estimate by measurement that two rays are missing. I have added this number to the count made of 26.

Rutilus rutilus (L.), 1758

Zoophyl. **1** : 107, 338.
Cyprinus pigus Gronovius (Gray), 1854 : 183, " in fluminibus lacubusque Europaeis ". Holotype.

This use of the name *pigus* is apparently independent of the proposal of the same name by Lacépède (1803).

1853.11.12.154. 128 mm.

Scardinius erythropthalmus (L.), 1758

Mus. Ichth. **1** : 3, 9 (probably the variety " a " as there are only seven pelvic rays). *Zoophyl.* **1** : 107, 340, " Frequens in arudinatis Belgiis ".
Cyprinus rutilus (*non* L.) Gronovius (Gray), 1854 : 183.
1853.11.12.155. 126 mm.

Scardinius erythropthalmus (L.), 1758

Mus. Ichth. **1** : 2, 8. *Zoophyl.* **1** : 107, 399.
Cyprinus ery(*thr*)*opthalmus*, Gronovius (Gray), 1854 : 183.

The spelling of the specific name as *eryopthalmos* in the manuscript is repeated in several places showing that the change was intentional. The " thr " in parenthesis in the published work was inserted by Gray.

1853.11.12.158. 325 mm.

Phoxinus phoxinus (L.), 1758

Cyprinus phoxinus, Gronovius (Gray), 1854 : 185.
1853.11.12.177. 61 mm.

Abramis brama (L.), 1758

Mus. Ichth. **1** : 3, 14. *Zoophyl.* **1** : 110, 345.
Cyprinus brama, Gronovius (Gray), 1854 : 180.

There were three references quoted by Linnaeus under this name, namely, the *Fauna Svecica* (1746 : 318), Artedi (1738 ; **3** : 20), and Gronovius. Of the three only the Gronovius reference and that of Artedi gave fin ray counts in their descriptions ; thus this specimen is part of the type series.

1853.11.12.147. 256 mm.

Abramis vimba (L.), 1758

This specimen does not appear to have been included in the manuscript, and Günther (1868 : 303) considered that Gronovius had " confounded this species with others (*A. ballerus*) etc.), as is evident from his description and synonymy ". It is possible that this accounts for its omission.

1853.11.12.153. 205 mm.

Blicca bjoerkna (L.), 1758

Zoophyl. **1** : 110, 344.
Cyprinus latus Gronovius (Gray), 1854 : 180. Holotype.

This specific name was also proposed, apparently independently, by Gmelin (1789) although he probably derived it from Bloch (1782 : 65).

1853.11.12.146. 172 mm.

Cyprinus carpio L., 1758

Mus. Ichth. **1** : 5, 19. *Zoophyl.* **1** : 104, 330.
Cyprinus carpio, Gronovius (Gray), 1854 : 177.

Linnaeus based his name on descriptions by Artedi (1738, **3** : 25) and Gronovius, and on a specimen in his own collection. One of these skins (139) is normally scaled and is probably the specimen which Gronovius described, and thus part of the type series.

1853.11.12.139.	184 mm.
1853.11.12.141.	187 mm.

Cyprinus carpio L., 1758

Cyprinus specularis Gronovius (Gray), 1854 : 178, " in Danubiae paludosis locis ". Holotype.

1853.11.12.140.	214 mm.

Squalius cephalus (L.), 1758

Zoophyl. **1** : 106, 335, " in *Rheno* propre Lugdunum ".
Cyprinus salmoneus Gronovius (Gray), 1854 : 186. Holotype.

1853.11.12.138.	388 mm.

Squalius cephalus (L.), 1758

Cyprinus leuciscus (*non* L.) Gronovius (Gray), 1854 : 184.

1853.11.12.156.	150 mm.

Carassius carassius (L.), 1758

? *Mus Ichth.* **1** : 3, 11. ? *Zoophyl.* **1** : 110, 343.
Cyprinus carassius, Gronovius (Gray), 1854 : 179.

In view of the discrepancies between the earlier descriptions and the counts made on this specimen, I am doubtful if this was the specimen described by Gronovius.

1853.11.12.142.	195 mm.

Carassius auratus (L.), 1758

Zoophyl. **1** : 108, 342.
Cyprinus chinensis Gronovius (Gray), 1854 : 181, varieties 1, 6, 8, 12. Syntypes.

It is interesting to note that one specimen (150) was given to Gronovius by Job Baster who, in 1760, bred the goldfish at Zierikzee, and who later published an account of his observations in *Acta Harlem.*

1853.11.12.149	89 mm.
1853.11.12.150.	62 mm.
1853.11.12.151.	112 mm.
1853.11.12.152.	75 mm.

Barbus barbus (L.), 1758

Mus. Ichth. **2** : 3, 20. *Zoophyl.* **1** : 104, 331.
Cyprinus barbus, Gronovius (Gray), 1854 : 177.

The *Museum Ichthyologicum* was one of two works quoted by Linnaeus, the other being that of Artedi, who, however, gave no fin ray counts in his description ; Linnaeus also had a specimen in his own collection, for which he gave fin ray counts. This specimen is therefore part of the type material.

1853.11.12.144.	265 mm.

Tinca tinca (L.), 1758

Mus. Ichth. **1** : 4, 18. *Zoophyl.* **1** : 103, 328.
Cyprinus tinca, Gronovius (Gray), 1854 : 179.
1853.11.12.143. 132 mm.

COBITIDAE

Cobitis taenia L., 1758

Mus. Ichth. **1** : 2, 5. *Zoophyl.* **1** : 56, 200.

This specimen is not apparently included in the manuscript ; it is not likely that it was referred to as *C. barbatula* as Günther (1868 : 362) suggested.

1853.11.12.176. 79 mm.

Misgurnus fossilis (L.), 1758

Mus. Ichth. **1** : 2, 7. *Zoophyl.* **1** : 56, 201.
Cobitis fossilis, Gronovius (Gray), 1854 : 40.

This specimen was also described by J. F. Gronovius in *Acta Upsala*, 1748 : 79, tab. 3. Linnaeus based his name on three references to earlier authors, namely, to J. F. Gronovius, descriptions by Artedi (1738, **4** : 2) and to his own *Museum Adolphi Friderici* (1754 : 76). This appears to be the original Gronovius specimen and should therefore be regarded as having type status.

1853.11.12.121. 163 mm.

SILUROIDEA

DORADIDAE

Doras cataphractus (L.), 1758

Mus. Ichth. **1** : 28, 71, tab. 3, figs. 3 and 4. *Zoophyl.* **1** : 127, 390, " Habitat in Americes Meridionalis rivulis ".
Callichthys asper Gronovius (Gray), 1854 : 157. Holotype.

In listing this specimen in the *Catalogue of Fishes* Günther (1864) said, " this is not the typical specimen of the species, described and figured by Gronow ; he says that he saw it in Seba's collection ; and besides, the present specimen is considerably larger than the one figured ". Actually Gronovius did not say that he saw the specimen in Seba's collection, but " Comparavi ex Museo Sebae ", a remark that often occurs in that work. It is difficult to understand why Günther should have used the plate as a guide to the length of the specimen. It is more probable that the figure was reduced or enlarged during drawing and engraving so that it best fitted the space available in the plate. For example, the figure of *Callorhynchus* on plate five of the *Museum Ichthyologicum* measures ten and a half inches, while the text gives the length as nine and two-third inches. Also, several of van Nieuwland's drawings in the manuscript are badly foreshortened, solely to fit them on to the small quarto paper used. For these reasons I disagree with Günther's conclusion, and regard this specimen as the one which was described by Gronovius in 1754. This description was referred to by Linnaeus, who also mentioned the description in Catesby (1743 : 19, tab. 9), and this specimen is thus part of the type series.

1853.11.12.193. 93 mm.

Siluridae

Silurus glanis L., 1758

Mus. Ichth. **1** : 6, 25, tab. 6, fig. 1, " . . . in Sinu Harlemensi frequens . . . ". *Zoophyl.* **1** : 101, 323.
Silurus glanis, Gronovius (Gray), 1854 : 134.

The reference in the *Museum Ichthyologicum* was quoted by Linnaeus following two references to his own works (1751 : 61), (1756 : 34), and one to Artedi (1738, **4** : 82).

1853.11.12.168. 191 mm.

Loricariidae

Loricaria ? cataphracta L., 1758 Plate 28, fig. 1.

Mus. Ichth. **1** : 26, 69. *Zoophyl.* **1** : 127, 392.
Plecostomus flagellaris Gronovius (Gray), 1854 : 158.

The measurements given in 1754 agree perfectly with those made on the specimen, except that part of the caudal filament is missing. The description in this work, was referred to by Linnaeus under *Loricaria cataphracta* and is the sole reference under his variety B ; it must be regarded as the type of this variety. Neither Regan (1904) nor Günther (1864) apparently recognized that this was one of the types of the species. I am doubtful if the specimen does belong to this species (of authors), but it is to be hoped that any future revision of these fishes will take this specimen and its resulting problem, into consideration.

1853.11.12.195. Upper surface 183 mm.
1853.11.12.196. Lower surface.

Head length	29	(16)	Dorsal fin, base	16·5	(9)
Snout to orbit	19	(10)	,, ,, height	4·8	(3)
,, ,, nostril	16	(9)	Anal fin, base	9	(5)
,, ,, dorsal fin origin	54	(29)	Pelvic fin, base	6	(4)
Diameter of orbit	7·5	(4)	,, ,, length	26	(14)
Vent to anal fin origin	15	(8)	Width of interorbital	7·5	(4)
Pectoral fin, base	9	(5)	Pectoral fin, length	33	(18)

Dorsal 1·7. Anal 6. Pelvic 1·5. Pectoral 1·6.

Snout broad and long ; orbit of moderate size, maximum diameter, measured to the extremity of the posterior notch, equals the interorbital width, which is about 3·5 in head length. Nape armed with three paired median spines. The underside of the head naked, with the barbels and sensory papillae around the mouth visible although completely dessicated. Four teeth on each side of the maxilla, and four in the left mandible, three in the right (probably one broken off short, as the others are spaced irregularly). Those in the mandible thin and long, curved slightly upwards, more than twice the length of the others, which are expanded sub-terminally and bear a weak cusp laterally.

Ventrally the scutes are irregular, small and numerous, but the outer series are more regular and posteriorly elongate ; there are ten scutes between their commencement and the base of the pelvic fins. There are three scutes between the vent and the origin of the anal fin, and 26 ventral scutes from anus to caudal fin. Thirty-two spined scutes, counting along the upper row from the head to the caudal fin, including one which is on the head, and thirty-three spinous scutes in the lower row from the pectoral fin base to the caudal fin. The two rows of spines converge fourteen scutes from the tail.

APODES

ANGUILLIDAE

Anguilla anguilla (L.), 1758

Mus. Ichth. **1** : 16, 45. *Zoophyl.* **1** : 40, 166.
Muraena anguilla, Gronovius (Gray), 1854 : 18.
1853.11.12.169. *ca.* 500 mm.

MURAENESOCIDAE

Muraenesox ferox (Costa), 1850[1]

Muraena myrus (*non* Brünnich) Gronovius (Gray), 1854 : 20, " . . . in Mari Mediterraneo . . . ". Holotype.
1854.11.12.171. 447 mm.

CONGRIDAE

Conger conger (L.), 1758

Muraena conger, Gronovius (Gray), 1854 : 19, " . . . in Mari Mediterraneo ".
1853.11.12.170. 392 mm.

SYNENTOGNATHI

BELONIDAE

Belone belone (L.), 1758

Mus. Ichth. **1** : 10, 30. *Zoophyl.* **1** : 117, 362.
Macrognathus scolopax Gronovius (Gray), 1854 : 147. Holotype.

Linnaeus based his name *Esox belone* on three earlier descriptions, in Artedi 1738, **5** : 27), Linnaeus (1746 : 305) and the *Museum Ichthyologicum*. This specimen is therefore part of the type series.

Although Gronovius (1854) indicated plainly enough that his *Macrognathus scolopax* was synonymous with *Esox belone* of Linnaeus, by listing the latter as a " synonym " (in this he was followed by Günther (1866 : 254)), Regan listed *Macrognathus* Gronovius as a synonym of *Macrorhamphosus*. Jordan (1919 : 259) in copying Regan, added further to the confusion by listing " *Macrognathus* Gronow 147 ; logotype *Centriscus scolopax* L. Name preoccupied ; a synonym of *Macrorhamphosus* Lac." It is unfortunate that neither Regan nor Jordan had referred to the description in Gronovius (1854), had they done so this confusion could never have occurred.

1853.11.12.147. *ca.* 730 mm.

HEMIRHAMPHIDAE

Hemirhamphus brasiliensis (L.), 1758

Zoophyl. **1** : 118, 363.
Macrognathus brevirostris Gronovius (Gray), 1854 : 148. Holotype.

Neither Gray (1854) nor Günther (1860 : 270) recognized this specimen as the Gronovius type.

1853.11.12.115. 180 mm.

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[1] This species is probably synonymous with *M. savana* (Bancroft), 1831. Regan (1915) claimed the two to be distinct, but the specimens he identified as *Muraenesox ferox*, are certainly not that species and appear to be more closely related to the American *M. coniceps* than to any West African-Mediterranean species.

EXOCOETIDAE

Exocoetus ? volitans L., 1758

Zoophyl. **1** : 116, 358. " Reperitur in Mari Hispanico ".
Exocoetus evolans L. Gronovius (Gray), 1854 : 144.

Linnaeus (1766 : 521) based the name *Exocoetus evolans* primarily on the description by Gronovius in the *Zoophylacium*, therefore this specimen, which corresponds very well with the description, may be regarded as the holotype of that species. Brunn (1935 : 22) examined this specimen and wrote of it, " Examination . . . could only determine naturally, that it was really an *Exocoetus*, but whether *E. volitans* or *E. obtusirostris* could not be quite settled with certainty, as the gill rakers could not be examined. The transverse scales were, however, fairly well preserved and showed 6½ rows, a result that Mr. J. R. Norman kindly confirmed. In all probability therefore *E. evolans* is synonymous with *E. volitans*." I can add nothing to this statement except, perhaps, to confirm the count of 6½ scales, and I consider that Brunn was justified in indicating that the two species were synonymous.

1853.11.12.181. 113 mm.

SOLENICHTHYES

AULOSTOMATIDAE

Aulostomus maculatus Valenciennes, 1842

Zoophyl. **1** : 119, 366.
Solenostomus chinensis non L. Gronovius (Gray), 1854 : 147.

For a detailed discussion of the status of this specimen, see Wheeler (1955*b*).

1853.11.12.102. 304 mm.

SYNGNATHIDAE

(The portion of the manuscript dealing with this genus is missing, if indeed it was even completed.)

Entelurus aequoreus (L.), 1758

Mus. Ichth. **1** : 1, 2. *Zoophyl.* **1** : 43, 171.

This specimen is labelled in Gronovius's hand *Syngnathus ophidion*, and it is one of the types of that species, for Linnaeus referred to the description in the *Museum Ichthyologicum* under that name. This misunderstanding was probably caused by Gronovius erroneously stating that there was no caudal fin (it is indeed difficult to see). Fortunately no nomenclatorial change need ensue from this composite type series, for the specimen described in Linnaeus (1746 : 334) and also referred to under this specific name in Linnaeus (1758) appears to be the species accepted as *S. ophidion*.

1853.11.12.185. 500 mm.

Syngnathus acus L., 1758

Mus. Ichth. **1** : 1, 3. *Zoophyl.* **1** : 43, 172.

Gronovius's (1754) description was given as the second reference by Linnaeus ;

this specimen is therefore part of the type series. The other references were to Artedi (1738), and to Linnaeus (1746 : 335).

1853.11.12.184.	378 mm.

ANACANTHINI

Merlucciidae

Merluccius merluccius (L.), 1758

Zoophyl. **1** : 97, 315.
Merlucius lanatus Gronovius (Gray), 1854 : 130. Holotype.

The use of *Merlucius* in the manuscript considerably antedates its first published usage by Rafinesque in 1810.

1853.11.12.113.	283 mm.

Gadidae

Gadus callarias L., 1758

Mus. Ichth. **1** : 21, 58. *Zoophyl.* **1** : 99, 319.
Gadus callarias, Gronovius (Gray), 1854 : 131.

Linnaeus based the specific name *callarias* on five references, namely Linnaeus (1746 : 293), Artedi (1738, **3** : 63), Gronovius (1754), Linnaeus (1745 : 87) and (1751 : 220). This specimen is therefore part of the type series.

1853.11.12.162.	195 mm.

Gadus luscus L., 1758

Mus. Ichth. **1** : 21, 60. *Zoophyl.* **1** : 99, 320.
Gadus colias (*non* L.) Gronovius (Gray), 1854 : 131. Holotype.

1853.11.12.163.	161 mm.

Gadus aeglefinus L., 1758

Mus. Ichth. **1** : 12, 59. *Zoophyl.* **1** : 99, 321.
Gadus aeglefinus, Gronovius (Gray), 1854 : 131.

The 1754 description is the third of five quoted by Linnaeus ; this specimen may therefore be regarded as a syntype.

1853.11.12.164.	255 mm.

Gadus merlangus L., 1758

Mus. Ichth. **1** : 20, 55. *Zoophyl.* **1** : 91, 316.
Gadus merlangus, Gronovius (Gray), 1854 : 132.

The description in Gronovius (1754) is the third of three references given by Linnaeus ; these specimens may thus be considered syntypes of the species.

1853.11.12.165.	177 mm.
1853.11.12.166.	148 mm.

Gadus virens L., 1758

Mus. Ichth. **1** : 20, 55. *Zoophyl.* **1** : 98, 317.
Gadus carbonarius L. Gronovius (Gray), 1854 : 132.

This specimen was also described by J. F. Gronovius in *Acta Upsaliensis* (1748), the length of the present specimen agrees very well with that given in that description, and I consider that it can be regarded as the original specimen. Linnaeus (under this name), referred to only two earlier descriptions, namely to his own *Fauna Svecica* (1746 : 296) and to J. F. Gronovius (1748). This specimen may therefore be regarded as part of the Linnaean type series.

1853.11.12.167.	284 mm.

Lota lota (L.), 1758

Mus. Ichth. **1** : 21, 61. *Zoophyl.* **1** : 97, 313.
Enchelyopus lota, Gronovius (Gray), 1854 : 101.

1853.11.12.119.	159 mm.

Onos mustelus (L.), 1758

Mus. Ichth. **1** : 21, 62. *Zoophyl.* **1** : 97, 314.
Enchelyopus mustela, Gronovius (Gray), 1854 : 101.

A description of this species by the elder Gronovius (1746) was referred to by Linnaeus, but as the specimen described was nine inches long I do not regard it as the same as the present specimen.

1853.11.12.118.	109 mm.

PERCOIDEA

Serranidae

Serranus cabrilla (L.), 1758

Zoophyl. **1** : 89, 295. " . . . Mare Mediterraneum insulam Melitam ".
Perca mormyrus (*non* L.) Gronovius (Gray), 1854 : 109.

1853.11.12.56.	121 mm.

Petrometopon cruentatus (Lacépède), 1803

Perca punctata (*non* L.) Gronovius (Gray), 1854 : 109.

This is probably one of the specimens collected by Garden in Carolina, for the manuscript reads, " . . . in Mari Americano ad Carolinam ". The number that Garden usually wrote on the side of the fish is missing in this case.

Not registered.	*ca.* 108 mm.

Centropristes striatus (L.), 1758

Perca atraria L. Gronovius (Gray), 1854 : 111.

This was one of Alexander Garden's specimens, it bears his number 7 on its side. Garden also sent to Linnaeus the holotype of *Perca atraria*, which is preserved in the collection of the Linnean Society (Günther, 1899).

1853.11.12.107.	230 mm.

Morone labrax (L.), 1766

Gronovius, J. F., *Acta Upsala.* 1751 : 39, tab. 4. *Mus. Ichth.* **1** : 41, 95. *Zoophyl.* **1** : 91, 300.
Perca labrax, Gronovius (Gray), 1854 : 115.

Linnaeus based his name *Perca labrax* on the descriptions by Gronovius (1751) and Artedi (1738, **4** : 41). This specimen is identical in length with that described and it is therefore probably part of the type series.

1853.11.12.1.	169 mm.

PERCIDAE

Acerina cernua (L.), 1758

Mus. Ichth. **1** : 41, 94. *Zoophyl.* **1** : 86, 288.
Perca cernua, Gronovius (Gray), 1854 : 112.

Gronovius (1754) was one of the three descriptions to which Linnaeus referred; this specimen is therefore one of the original types.

1853.11.12.5. 101 mm.

Acerina schraetser (L.), 1758

Zoophyl. **1** : 86, 289. " . . . in Danubio ".
Perca danubiensis Gronovius (Gray), 1854 : 112. Holotype.

Although Gronovius identified this specimen with *Perca schraetser* Linnaeus by listing the latter in the " synonymy ", he also gave it the new name of *danubiensis*.

1853.11.12.41. 118 mm.

Perca fluviatilis L., 1758

Mus. Ichth. **1** : 42, 96. *Zoophyl.* **1** : 91, 301.
Perca vulgaris Gronovius (Gray), 1854 : 114.

Gronovius (1754) was listed by Linnaeus after references to Artedi (1738, **3** : 74) and his own *Fauna Svecica* (1746 : 285), this specimen is therefore part of the type series of Linnaeus's species.

1853.11.12.3. 130 mm.

Perca fluviatilis L., 1758

? *Zoophyl.* **1** : 92, 302.
Perca helvetica Gronovius (Gray), 1854 : 113. Holotype.
1853.11.12.2. 107 mm.

Aspro zingel (L.), 1766

Zoophyl. **1** : 92, 303, " Habitat in Danubio . . . ".
Perca asper (*non* L.) Gronovius (Gray), 1854 : 115.

Linnaeus (1766) based his name *Perca zingel* on three earlier references, namely, Gronovius (1763), Schaeffer (1761 : 58, tab. 3, fig. 1) and Kramer (1756 : 386). The present specimen should therefore be considered as one of the types. It should be noted that this specimen was given to Gronovius by Kramer.

1853.11.12.81. 177 mm.

POMATOMIDAE

Pomatomus saltatrix (L.), 1766

Chromis epicurorum Gronovius (Gray), 1854 : 149. Holotype. " Habitat in mari Carolinam alluente. Piscis sapidissimus et palato. Epicurorum gratissimus . . . Anglis Carolinam inhabitantibus audit *Fat back* et *Ship Jack*."

This specimen bears the Garden collection number 11.

1853.11.12.45. 366 mm.

RACHYCENTRIDAE

Rachycentron canadus (L.), 1766

Thynnus canadensis, Gronovius (Gray), 1854 : 122. " . . . in Mari Carolinam Meridionalem alluente."

Gronovius had written on the back of the skin the name *Scomber canadensis*, but the drawing of this specimen in the manuscript is labelled *Thynnus canadensis*. This is another of Garden's Carolina specimens.

1853.11.12.161. 500 mm.

CARANGIDAE

Chorinemus sancti-petri C. & V., 1831

Zoophyl. **1** : 93, 305.
Thynnus moluccensis Gronovius (Gray), 1854 : 121. Holotype.

Gronovius (1763) confused this species with *Scomber thynnus* Linnaeus, and as a result Linnaeus (1766) included the description in the *Zoophylacium* in his synonymy of that species.

1853.11.12.29. 142 mm.

Naucrates ductor (L.), 1758

Zoophyl. **1** : 94, 309, " Inhabitat Mare Mediterraneum . . . ".
Thynnus pompilus Gronovius (Gray) 1854 : 123. Holotype.

Gray identified this specimen as *Sarda immaculata* of the manuscript, but this is obviously incorrect. *Sarda immaculata* is probably a synonym of *Scomber pelagicus* (= *Coryphaena hippurus* L.).

1853.11.12.41. 111 mm.

Caranx hippos (L.), 1766

Mus. Ichth. **1** : 34, 82. *Zoophyl.* **1** : 94, 307.
Trachurus cordyla Gronovius (Gray), 1854 : 124. Holotype.
1853.11.12.93. 59 mm.

Caranx chrysos (Mitchill), 1815

Trachurus squamosus Gronovius (Gray), 1854 : 125. Holotype.

This specimen bears Garden's number of 17, it formed part of his Carolina collection.

1853.11.12.94. 270 mm.

Trachurus trachurus (L.), 1758

Mus. Ichth. **1** : 34, 82. *Zoophyl.* **1** : 94, 308.
Trachurus europaeus Gronovius (Gray), 1854 : 125. Holotype.
1853.11.12.95. 189 mm.

Chloroscombrus chrysurus (L.), 1766

Scomber latus Gronovius (Gray), 1854 : 127. Holotype.

This specimen was also part of Garden's Carolina collection.

1853.11.12.96. 227 mm.

LUTIANIDAE

Lutjanus kasmira (Forskål), 1775

Perca lineata Gronovius (Gray), 1854 : 110. Holotype.

The longitudinal stripes on the body of this specimen, now faded to a light greeny-blue, are five in number, placing it in the form *quinquelineatus*.

1853.11.12.58. 174 mm.

LEIOGNATHIDAE

Leiognathus equulus (Forskål), 1775

Although named (but not in Gronovius's hand), as *Scomber indicus* and bearing the number 50 which relates to *Scomber* in the manuscript, there is no description which agrees with this specimen.

1853.11.12.97. 138 mm.

SCIAENIDAE

Cynoscion regalis (Bloch (Schneider)), 1801

Cestreus carolinensis Gronovius (Gray), 1854 : 49. Holotype.

This specimen is part of Garden's collection, and is referred to in the manuscript as the " Sea Trout ", a vernacular name which Jordan & Everman (1898 : 1407) also give for this species.

1853.11.12.42. 344 mm.

Orthopristis chrysopterus (L.), 1766

Although this specimen was part of Alexander Garden's collection it is not mentioned in the manuscript. It is of interest to note that Linnaeus described this species from a specimen from the same source.

1853.11.12.43. 220 mm.

Umbrina cirrosa (L.), 1758

Mus. Ichth. **1** : 39, 92. *Zoophyl.* **1** : 59, 212.
Sciaena cestreus Gronovius (Gray), 1854 : 52. Holotype.

Linnaeus based his name *Sciaena cirrosa* on two earlier references namely, to Artedi (1738, **4** : 38), and to Gronovius's description in the *Museum Ichthyologicum* (although this reference was followed by a question mark). Two points in the Gronovius description require clarification. In 1754 the locality for the species was given as the rivers of Surinam (" Locus natalis Surinamae fluvius est "), but in the *Zoophylacium* it was altered to " Habitat in Mari mediterraneo ", while the manuscript reads " Habitat in Mari Americano, quandoque et Mediterraneo ". I have already commented (Wheeler, 1955*b*) on the unreliability of some of Gronovius's locality ascriptions, and I would have considered it legitimate to ignore the locality of Surinam, if it were not for a discrepancy in the dorsal fin count for this specimen and the number given in the *Museum Ichthyologicum*. Here it is stated that there are thirty-six rays in the dorsal fin, of which the first ten are " simplicia et aculeata ", but this specimen has a dorsal fin comprised of ten spines and twenty-four soft rays. This agrees with the number given in the manuscript, and for this reason, I conclude that this specimen was not the same as the one described in the *Museum Ichthyologicum*, and as such it is not one of the types of *Sciana cirrosa*. It is probable that this skin was an addition to the collection after the publication of the *Zoophylacium*, which would also explain its excellent condition.

1853.11.12.74. 367 mm.

Menticirrhus americanus (L.), 1758

Sciaena alburnus (*non* L.) Gronovius (Gray), 1854 : 51.

There is an excellent figure in the manuscript of this specimen, which bears Garden's collection number 2.

1853.11.12.75. 228 mm.

MULLIDAE

Mullus barbatus L., 1758

Mus. Ichth. **1** : 43, 99. *Zoophyl.* **1** : 85, 286.
Mullus barbatus, Gronovius (Gray), 1854 : 108.

Linnaeus based his name on two references, and on a specimen in his own collection. The two references were to Artedi (1738, **4** : 43) and to Gronovius's description in the *Museum Ichthyologicum*. This specimen is therefore probably one of the original type series.

1853.11.12.14. 205 mm.

SPARIDAE

Pachymetopon blochii (Val.), 1830

This specimen is not included in the manuscript, although the description of *Cynaedus striatus* fits it fairly well. There are, however, several discrepancies, notably in the locality " Oceano Indico ", although this species appears to occur only off the South African coast ; and in the length of the specimen, nine and a half inches, against the published " longitudo semipedalis ".

1853.11.12.85. 200 mm.

Stentomus chrysops (L.), 1766

Cynaedus brama Gronovius (Gray), 1854 : 56. Holotype.

Günther (1859 : 409) failed to recognize this specimen as the type of *Cynaedus brama* Gronovius, and made it one of the four syntypes of his own *Sargus ambassis*, and synonymized the Gronovius name with *Sargus unimaculatus* (Bloch). Jordan & Everman (1898 : 1360) copied Günther in this synonymy but relegated his *Sargus ambassis* to the synonymy of *Stenotomus chrysops*.

This specimen bears the Garden collection number 13.

1853.11.12.76. 163 mm.

Archosargus probatocephalus (Walbaum), 1792

Perca leonina Gronovius (Gray), 1854 : 113. Holotype.

Gronovius under this name, refers to the *Zoophylacium* (**1** : 60, 213) which, however, is a description of the South African species *Chrysoblephus laticeps* (a specimen of which is still preserved in the collection). The present specimen, although not now in good condition, is well illustrated in the manuscript, and this is labelled in Gronovius's hand, thus confirming the identification.

1853.11.12.34. 300 mm.

Boops boops (L.), 1758

Zoophyl. **1** : 63, 218.
Cynaedus gracilis Gronovius (Gray), 1854 : 57. Holotype.
1853.11.12.22. 202 mm.

Boops salpa (L.), 1758

Zoophyl. **1** : 62, 216
Cynaedus onias Gronovius (Gray), 1854 : 55. Holotype.
1853.11.12.83. 125 mm.

Spondylisoma cantharus (Gmelin), 1788

Apparently this specimen was not included in the manuscript.

1853.11.12.84. 98 mm.

Lithognathus lithognathus (Cuv.), 1829

On the back of this skin there is a label in Gronovius's hand, but unfortunately only the generic name *Cynaedus* is clear although the last three letters of the specific name appear to be . . . *ius*. There is no such termination to any of the names in this genus in the manuscript. The sheet on which the specimen is mounted also bears a label *Cynaedus cyprinoides*, but again this name is not recorded in the manuscript.

1853.11.12.23. 204 mm.

Argyrozona argyrozona (Val.), 1830

Zoophyl. **1** : 60, 214.
Cynaedus lupus Gronovius (Gray), 1854 : 54. Holotype.
1853.11.12.20. 368 mm.

Chrysoblephus laticeps (Cuv.), 1830

Zoophyl. **1** : 60, 213.
Cynaedus torvus Gronovius (Gray), 1854 : 54. Holotype.

Günther confused this skin with *Perca leonina* of Gronovius (see p. 222) although in both cases the fishes themselves are labelled in Gronovius's hand, and there are good figures in the manuscript.

It is of interest to note that Smith (1949 : 272) gives as the vernacular name of this species " Roman or Red Roman ", and Gronovius (1763) added to his description " Inhabitat Mare Promontorium Bonae Spei alluens, ubi ab incolis *Rooman* a rubro colore vocatur ".

1853.11.12.21. 254 mm.

GIRELLIDAE

Dipterodon capensis Cuv. & Val., 1831

Zoophyl. **1** : 66, 226.
Coracinus aper Gronovius (Gray), 1854 : 57. Holotype.
1853.11.12.215. 200 mm.

SCATOPHAGIDAE

Scatophagus argus (L.), 1766 Plate 29, fig. 1.

Sargus maculatus Gronovius (Gray), 1854 : 65. Holotype.

This specimen was given to Gronovius by Pieter Boddaert, who in 1770 published a very detailed description of the species, in " . . . de *Chaetodonte Argo* . . . ".

The specimen that he described he had purchased from the collection of Johannes Albert Schlosser, an Amsterdam physician, and the owner of a large collection of natural history specimens, who died during 1769. The measurements given by Boddaert, " Altitudinem a Ventre ad Dorsam trium pollicum, totodemque linearum inveni, et longitudinem trium pollicum, cum quinque lineis ", fit the present specimen well, and it seems probable that this is the same specimen that was purchased at the sale of Schlosser's collections.

1853.11.12.82. 83 mm.

Chaetodontidae

Heteropyge sexstriatus Cuv. & Val., 1831

Chaetodon resimus Gronovius (Gray), 1854 : 71. Holotype.

There is a fine drawing of this specimen in the manuscript, labelled *C. resimus* in Gronovius's hand, which proves that this specimen is the one described under that name, and that Günther was in error in claiming this as the type specimen of *C. vorticosus* (a synonym of *Holacanthus annularis* Bloch).

1853.11.12.61. 115 mm.

Holacanthus ciliaris (L.), 1758

? *Zoophyl.* **1** : 68, 231.
Chaetodon aculeatus Gronovius (Gray), 1854 : 72. Syntype.
1853.11.12.64. 248 mm.

Holacanthus ciliaris (L.), 1758

Mus. Ichth. **2** : 36, 192. *Zoophyl.* **1** : 69, 232.
Chaetodon aculeatus Gronovius (Gray), 1854 : 73. Syntype.

The description of the colour pattern in the *Museum Ichthyologicum* agrees exactly with the markings on the present specimen. Linnaeus, in naming this species, referred to the description in that work, before the other references he gave (Linnaeus, 1754 : 62 ; 1757 : 273). This is therefore part of the original type series, although Fraser-Brunner (1933) who examined the specimen, did not note it as such.

1853.11.12.65. 85 mm.

Pomacanthus annularis (Bloch), 1787

Chaetodon vorticosus Gronovius (Gray), 1854 : 74. Holotype.
1853.11.12.66. 124 mm.

Chaetodontoplus mesoleucus (Bloch), 1787

Chaetodon atratus Gronovius (Gray), 1854 : 72. Holotype.

Fraser-Brunner (1933) ascribed to this specimen the locality of Singapore, although Gronovius merely stated " Habitat in India ".

1853.11.12.62. 127 mm.

Chelmon rostratus (L.), 1758

Mus. Ichth. **1** : 48, 109. *Zoophyl.* **1** : 69, 233.
Chaetodon rostratus, Gronovius (Gray), 1854 : 73.

The detailed measurements given (1754) of the specimen described, correspond very closely with the present specimen if allowance is made for the damage to the snout and caudal fin.

The description in the *Museum Ichthyologicum* was one of the two references that Linnaeus gave for his species *Chaetodon rostratus*. The other was to a description in his *Museum Adolphi Friderici* (Linnaeus, 1754 : 61). The present specimen is therefore part of the type series.

1853.11.12.63. 115 mm.

Chaetodon striatus L., 1758

Mus. Ichth. **1** : 49, 110 ; **2** : 38, 110. *Zoõphyl.* **1** : 70, 235.
Chaetodon striatus, Gronovius (Gray), 1854 : 68.

Linnaeus based his name *striatus* on four earlier descriptions, namely those of Linnaeus (1754 : 62 ; 1749 : 313), Artedi (1738, **3** : 95) and Gronovius (1754 : 49). This specimen is therefore part of the original type material.

1853.11.12.67. 54 mm.

Chaetodon capistratus L., 1758

? *Mus. Ichth.* **2** : 37, 195. ? *Zoophyl.* **1** : 70, 237.
Chaetodon capistratus, Gronovius (Gray), 1854 : 67.

There is a table of measurements given in the *Museum Ichthyologicum* in which the total length is given as 2·3 inches, the present specimen, however, measures three inches. It is therefore doubtful if it is the original specimen described by Gronovius, and it would not be surprising if this common Atlantic fish had been replaced in the collection.

It is of interest to note in this context that Linnaeus based his name on three references ; Linnaeus (1754 : 63 ; 1749 : 314) and Gronovius's description in the *Museum Ichthyologicum*, so that if this specimen is the original of the Gronovius description it must be considered part of the type series. Meek & Hildebrand (1928 : 787) were thus in error when they stated that this species was " based on a specimen in Mus. Adolphi Frederici (*sic*) " (Linnaeus, 1754). Although their contention that this name should be restricted to the Atlantic species is supported by the Gronovius specimen (the locality for which was " Mare Atlanticum sub Zone torrida "), this was in direct contradiction with Linnaeus's " Habitat in Indiis ".

1853.11.12.68. 66 mm.

Chaetodon punctato-fasciatus Cuv. & Val., 1831

Chaetodon punctato-lineatus Gronovius (Gray), 1854 : 70. Holotype.
1853.11.12.70. 56 mm.

Chaetodon octofasciatus Bloch, 1787

Chaetodon octolineatus Gronovius (Gray), 1854 : 69. Holotype.
1853.11.12.71. 67 mm.

Coradion chrysozonus (Cuv. & Val.), 1831

Chaetodon guttatus Gronovius (Gray), 1854 : 71. Holotype.

There is a figure of this specimen in the manuscript, signed by van Nieuwland " ad viv del 1774 ". A small paper label with the number 16 printed on it is pasted on the back of the specimen.

1853.11.12.72. 121 mm.

Chaetodon sp.

Chaetodon unifasciatus Gronovius (Gray), 1854 : 69. Holotype.

This specimen is very poorly preserved.

1853.11.12.69. 35 mm.

Cichlidae

Crenicichla saxatilis (L.), 1758 Plate 30, fig. 2.

Mus. Ichth. **2** : 28, 185, tab. 6, fig. 3. *Zoophyl.* **1** : 67, 229, tab. 6, fig. 3.
Scarus pavoninus Gronovius (Gray), 1854 : 63. Holotype.

Linnaeus based his species *Sparus saxatilis* on two earlier descriptions, one in his own *Museum Adolphi Friderici* (1754 : 65) and the other in the *Museum Ichthyologicum* Lönnberg (1896) does not list the former specimen as being amongst those still preserved in the University of Upsala, and presumably it is no longer in existence. This specimen is therefore probably the only remaining part of the type material. It was not mentioned by Regan (1905),

1853.11.12.24. 107 mm.

Length of head	36	(34)	Width of premaxillary	3	(3)
Snout to eye	10·5	(10)	Body depth at dorsal origin	26	(25)
,, ,, pectoral origin	37	(35)	Length of dorsal fin base	67	(63)
,, ,, dorsal origin	35	(33)	,, ,, anal fin base	15	(14)
,, ,, anal origin	81	(76)	Longest pectoral ray	20	(19)
Diameter of orbit	8	(8)	,, pelvic ray	19	(18)
Postorbital length	18	(17)	Depth of caudal peduncle	12·5	(12)

Dorsal XVII.14. Anal III.9. Pelvic I.5. Pectoral 14.

Head with pointed snout, lower jaw protruding ; gape equal to snout, two and a half times in head, eye moderate, in anterior half of head. Dorsal fin origin above the upper edge of the operculum and extending from thence to the caudal peduncle, moderately low, spines (except for the first three) all equal in height, soft rays a little longer, fourth from the last the longest. The hind margin of the fin is angular. Caudal fin broadly rounded, middle rays slightly produced. Anal fin short, its height as great as the dorsal, and also with a pointed posterior margin, it ends slightly anterior to the last rays of the dorsal fin. Pelvic fin strong, mid rays longest, pectoral fin weak, longest rays about equal to pelvic rays.

There are twenty-four, and ten scales in the lateral lines. At the end of the spinous dorsal there are 3½ rows above the anterior line, and 9½ below ; 4 above and below the posterior line, counted on the caudal peduncle.

Colour : In general, this skin has faded to a golden-brown, lighter below than above, but a few marks can be distinguished on it. There is a dark ocellus, rather larger than the orbit, above and slightly behind the pectoral fin base. Also there is an indistinct mark behind the orbit, and a number of dark blotches scattered over the sides and back but too indistinct to be clearly described. The caudal peduncle has a dark mark across the base of the fin rays, and on the origin of the upper caudal rays there is another smaller ocellus. The membrane of the caudal fin appears to have alternate light and dark markings. The edge of the membrane of both dorsal and anal fins is tinged dark, as are the tips of the middle rays of the caudal fin.

CHILODACTYLIDAE

Chilodactylus fasciatus Lacépède, 1803

Zoophyl. **1** : 64, 221, tab. 10, fig. 1.
Trichopterus indicus Gronovius (Gray), 1854 : 162. Holotype.
1853.11.12.25. 181 mm.

POMACENTRIDAE

Premnas biaculeatus (Bloch), 1790

Sargus ensifer Gronovius (Gray), 1854 : 66. Holotype.
1853.11.12.32. 103 mm.

Amphiprion polymnus (L.), 1758

Mus. Ichth. **1** : 38, 91. *Zoophyl.* **1** : 66, 227.
Coracinus vittatus Gronovius (Gray) 1854 : 57. Holotype.
1853.11.12.33. 62 mm.

Dascyllus trimaculatus (Rüppell), 1828

Sparus nigricans Gronovius (Gray), 1854 : 61. Holotype.

There is small slip of paper with a printed number 3, stuck on the back of this skin. A figure of the specimen is labelled *Sparus* ******, in the manuscript, which name was evidently altered later in the text.

1853.11.12.103. 95 mm.

Pomacentrus fuscus Cuv. & Val., 1830

This specimen is not included in the manuscript, although Günther (1862 : 31) regarded it as part of Gronovius' *Sparus nigricans*. I am unable to uphold this view as the figure and the description of that species agree so well the specimen listed above, and but poorly with this skin.

1853.11.12.104. 72 mm.

Abudefduf saxatilis vaigiensis (Quoy & Gaimard), 1824

Mus. Ichth. **1** : 37, 89. *Zoophyl.* **1** : 64, 222.
Sparus fasciatus Gronovius (Gray), 1854 : 60. Holotype.

This specimen shows no signs of the colour pattern, usually so distinct in this species, but an illustration of the skin in the manuscript shows the transverse bands distinctly. The fifth band is confined to the caudal peduncle, which, according to de Beaufort (1940 : 408) is typical of this subspecies.

Linnaeus based his name *Chaetodon saxatilis* on three earlier descriptions; two in his own works (Linnaeus, 1754 : 64; 1749 : 312), and the third in the *Museum Ichthyologicum*. Lönnberg (1896) has shown that the specimen described in the first of these works is actually the American subspecies, which Cuvier & Valenciennes, Günther and authors called *Glyphisodon saxatilis*. De Beaufort (1940) and others have accepted Lönnberg's determination without reservation, and it has never been pointed out that Linnaeus based his name on more than one reference, and consequently on more than one specimen. Gronovius gave no locality for his fish in the original description, but in the manuscript it is given as " Habitat in Mari Indico ", and the identification of the illustration leaves no doubt that the specimen came from the Indo-Pacific. Thus it appears that the Linnaean species is composite, and the name must therefore be restricted in the sense used by the first reviser. This appears to have been Bloch (ed. Schneider) (1801 : 833, tab. 1), where the species is said to come from " in aquis dulcibus Surinami ". and the plate given by Bloch (1794) almost certainly represents an American specimen. This fortunately means that no change in the accepted name is called for.

1853.11.12.105.	95 mm.

Abudefduf coelestinus (Cuv. & Val.), 1830

This specimen does not appear to have been described in the manuscript, although there is an unnamed illustration of it there.

1853.11.12.106.	81 mm.

LABRIDAE

Sparisoma viride (Bonnaterre), 1788

Callyodon psittacus (*non* L.) Gronovius (Gray), 1854 : 84.

This is another of Garden's specimens, it bears his number 13 on its side.

1853.11.12.36.	336 mm.

Platyglossus bivittatus (Bloch), 1792

Labrus multicostatus Gronovius (Gray), 1854 : 81. Holotype.

This specimen bears Garden's collection number 2 on its side. The same collector also sent specimens of this species to Linnaeus who, however, confused it with his own *Labrus radiatus*, and he listed it as *Sparus radiatus* in 1766.

1853.11.12.38.	165 mm.

Thalassoma lunare (L.), 1758

Mus. Ichth. **2** : 26, 180, tab. 6, fig. 2. *Zoophyl.* **1** : 71, 242, tab. 6, fig. 2.
Labrus lunaris, Gronovius (Gray), 1854 : 82.

Linnaeus based the name *Labrus lunaris* on a specimen in his own collection, and on the description in the *Museum Ichthyologicum*. This specimen is therefore part of the type series.

1853.11.12.39.	145 mm.

Callyodon bicolor (Rüppell), 1828

? *Zoophyl.* **1** : 72, 245 (probably from authors only).
Callyodon scriptus Gronovius (Gray), 1854 : 85. Holotype.

1853.11.12.37.	337 mm.

Callyodon mutabilis Gronovius (Gray), 1854.

Callyodon mutabilis Gronovius (Gray), 1854 : 86. Holotype.

There is an ink and wash figure of this specimen in the manuscript, which is labelled *C.* *******, as also is the skin, although the name was altered in the manuscript to that published by Gray.

This species is one of the few of Gronovius's names which were valid when published in 1854, although as Günther (1862 : 231) failed to list the specimen, the fact that the type exists has been overlooked.

1853.11.12.87.	156 mm.

Head length	47 (30)	Length of dorsal fin base	87 (56)
Snout length	19 (12)	Depth of caudal peduncle	21 (14)
Orbit diameter	10 (6)	,, ,, body	60 (38)
Depth of cheek	12 (8)	Length of anal fin base	40 (26)
Snout to dorsal origin	50 (32)	Length of the pectoral fin	34 (22)
,, ,, pectoral base	47 (30)		

Dorsal IX.10. Anal III.9. Pectoral I.11.

Head 3·3 in body, eye about the middle of the head. There are two rows of scales on the cheek, with five scales in the upper row and six in the lower ; two rows also on the lower preopercular limb. The origin of the dorsal and the pelvic fins is slightly in advance of the posterior edge of the operculum, which is itself slightly anterior to the pectoral fin base. The base of this fin is oblique, the upper ray longest, two and a half times longer than the lowest ray. Dorsal fin low, both spines and rays less than the snout length, it terminates just before the caudal peduncle. The anal fin is almost as high as the dorsal but much shorter, its origin beneath the second dorsal ray, it extends a little past the end of the dorsal base. Caudal fin fairly short, its posterior edge rather square. There are 18 + 7 scales in the lateral line, with two rows above and six below. Both the upper and lower jaws have two posterior caniniform teeth, those in the lower jaw being closer together and rather larger than the upper.

Colour : There is a general greenish tinge on all the scales, except those of the abdomen and head. The dorsal surface of the head is darker than elsewhere, with green lines at the base of the lips ; the line on the lower jaw runs upwards to meet the upper and together they run back to the lower front margin of the eye. This line appears to continue behind the orbit to a level with the pupil, and is then produced into a short backwardly directed line. Another at the back upper edge of the orbit runs over the top of the eye and then across the interorbital. A few green spots on the front lower limb of the operculum. The lips are edged with green. There are two distinct green stripes on the dorsal fin, the lower just above the scaly sheath and extending only as far as the third ray. The other commences at about the last dorsal spine. The caudal fin has its outer rays tinged with green along their whole length, while the anterior half of the membrane is distinctly green. The anal fin has two distinct green lines, one rising about half way up the first spine and running along the whole fin, to end almost at the tip of the last ray. The other streak runs along the scaly sheath and ends as a series of faint blotches.

Callyodon sp.

This specimen does not appear to have been included in the manuscript. There is a small printed label with the figure 5 on the back of the skin.

1853.11.12.88. 192 mm.

Bodianus mesothorax (Bloch), 1801

Scarus mordax Gronovius (Gray), 1854 : 64. Holotype.

There is a very good pencil sketch of the specimen in the manuscript, the work of Bylaart and dated 1768.

1853.11.12.89. 139 mm.

Labrus merula L., 1758

Zoophyl. **1** : 67, 228.
Scarus viridis (*non* L.) Gronovius (Gray), 1854 : 63.
1853.11.12.90. 185 mm.

Hemigymnus melapterus (Bloch), 1791

This skin was not apparently included in the manuscript, and it does not agree with any of the species of *Scarus* described there, although a pencil note in Gray's hand reads *Scarus caninus*. Unless the published figure of 19 dorsal-fin spines in that species is incorrect it cannot be *S. caninus* as there are only nine spines in the present specimens' dorsal fin.

1853.11.12.91. 227 mm.

AMMODYTIDAE

Ammodytes lancea Yarrell, 1836

Mus. Ichth. **1** : 13, 35. *Zoophyl.* **1** : 133, 404.
Ammodytes tobianus (*non* L.) Gronovius (Gray), 1854 : 159.
1853.11.12.108. 145 mm.

TRACHINIDAE

Trachinus vipera Cuvier, 1829

Mus. Ichth. **1** : 42, 97 (part).
Trachinus horridus Gronovius (Gray), 1854 : 46. Holotype.

In the *Museum Ichthyologicum* Gronovius recognized two varieties of *Trachinus*; one was *Trachinus draco* L., the other was this species. The fin ray counts he gave on that occasion are identical with those made on this specimen, and it may be assumed that this is the specimen which he described in 1754.

1853.11.12.6. 104 mm.

Trachinus draco L., 1758

Mus. Ichth. **1** : 42, 97 (part). *Zoophyl.* **1** : 80, 274.
Trachinus draco, Gronovius (Gray), 1854 : 46.

The description in the *Museum Ichthyologicum* was the third cited by Linnaeus under this name. This skin is therefore part of the type series.

1853.11.12.7. 290 mm.

URANOSCOPIDAE

Uranoscopus scaber L., 1758

Callionymus araneus Gronovius (Gray), 1854 : 44. Holotype.
1853.11.12.10. 135 mm.

ACANTHUROIDEA

ZANCLIDAE

Zanclus cornutus (L.), 1758

Gonopterus moerens Gronovius (Gray), 1854 : 77. Holotype.
1853.11.12.73. 54 mm.

ACANTHURIDAE

Acanthurus hepatus (L.), 1766 Plate 31.

Zoophyl. **1** : 113, 353.
Acronurus fuscus Gronovius (Gray), 1854 : 191. Holotype.

Linnaeus based his name on five earlier descriptions, Brown (1756 : 455), Gronovius (1763 : 113), Seba (1758 : 104), Catesby (1743 : 10), and Valentyn (1726 : 77). The Gronovius description is the only one in which fin ray counts are given, and in which the description is at all detailed. As none of the specimens described in the other works are known to be in existence, the present specimen should be regarded as the type. It has already been accorded this status by Jordan & Evermann (1898 : 1692).

1853.11.12.101. 123 mm.

SIGANOIDAE

Siganus javus (L.), 1766 Plate 30, fig. 1.

Zoophyl. **1** : 113, 352, tab. 8, fig. 4.
Teuthis brevirostris Gronovius (Gray), 1854 : 143. Holotype.

Linnaeus based his name *Teuthis javus* on descriptions in the *Zoophylacium*, and in Valentyn's *Oud & Nieuw Oost-Indiën* (1726), although the latter reference was probably copied from Gronovius who gave it in his " synonymy " of the species.

The illustration in Valentyn's work, like most of his figures, is very poor indeed, and the description gives no critical information. It appears to me, however, to represent, not a siganid but one of the species of *Acanthurus*. This opinion is independently confirmed by Cuvier & Valenciennes (1835 : 123) who wrote, " Gronovius lui-même se trompe en citant la figure 410 de Valentyn comme celle de son poisson : elle représente un acanthure ". Moreover, in the same volume (: 191) these authors refer this figure to *Acanthurus glaucopareius* Cuvier, 1829, although having regard to the quality of the description referred to, I can neither deny nor confirm this identification. This then, leaves the Linnean species as if based only on the specimen described by Gronovius.

There is no doubt that the present skin is the original of the Gronovius description, for the counts given there agree exactly, and the illustration is obviously of the same fish. After examination of the specimen I have concluded that although it is the type-specimen of *Teuthis javus* L., it is actually referable to the species that has hitherto been known as *Siganus oramin* Bloch, 1801. Some nomenclatural change is therefore inevitable. The name *Siganus oramin* becomes a synonym of *Siganus javus* (*sensu stricto*), and the species previously known as *S. javus* needs another name. Fortunately, it is not necessary to introduce another name as *Amphacanthus russelii* Cuv. & Val. is clearly a synonym of *S. javus* of authors. To summarize, the species previously known as *S. javus* (L.) must become *Siganus russelii* (Cuv. & Val.) and the name *Siganus oramin* Bloch must be replaced by *S. javus*. *Teuthis brevirostris* Gronovius (Gray) is an objective synonym of *Siganus javus* (L.).

1853.11.12.30. 133 mm.

Head length	35 (26)	Length of dorsal base	88 (67)
Snout length	13 (10)	,, ,, anal base	54 (41)
Diameter of orbit	12 (9)	,, ,, pectoral fin	23 (17)
Depth of suborbital	10 (8)	,, ,, first dorsal spine	13 (10)
,, ,, caudal peduncle	10 (8)	,, ,, fifth ,, ,,	19 (14)
,, ,, body at anus	47 (36)	,, ,, last ,, ,,	10 (8)
Snout to dorsal origin	38 (29)	,, ,, second anal spine	17 (13)

Dorsal XIII.10. Anal VII.9. Pectoral 12.

Body almost regularly oval, head nearly four times in standard length. Snout blunt, upper jaw prominent ; the nape to the upper jaw in a straight line. Pelvic fin origin posterior to the pectoral which is only slightly posterior to the first dorsal spine ; anal fin origin below the ninth dorsal spine. Pelvic fins shorter than the pectorals. Both dorsal and anal fins extend to the caudal peduncle which is very narrow and compressed. The caudal fin is forked. The third, fourth and fifth spines in the anal fin are nearly subequal, the first slightly longer than these and as long as the longest dorsal spine. The soft anal is low and the rays equal, but the tips are much damaged.

Colour : The dorsal surfaces of the snout, head and nape are a medium-dark brown, and the dorsal surface of the body light golden-brown, as are the fin spines and membranes, while below the colour is silvery. The head, body and tail are covered with numerous small round white blotches, which appear to be smaller than the ground colour in between each spot. There is a definite dark spot above the pectoral and at the base of the lateral line. The tips of the caudal fork are regularly coloured brown, and the markings on the caudal appear to be regular.

Siganus vulpinus (Schlegel & Muller), 1839–40

Teuthis tubulosa Gronovius (Gray), 1854 : 142. Holotype.
1853.11.12.31. 214 mm.

SCOMBROIDEA

SCOMBRIDAE

Scomber scombrus L., 1758

Mus. Ichth. **1** : 34, 81. *Zoophyl.* **1** : 93, 304.
Cordylus scombrus, Gronovius (Gray), 1854 : 163.

The description in the *Museum Ichthyologicum* is the third quoted by Linnaeus. The other two references were to his own *Fauna Svecica* (1746 : 287) where no fin ray counts were given, and to Artedi (1783, **3** : 68). This specimen is therefore part of the type series.

1853.11.12.28. 202 mm.

GOBIOIDEA

GOBIIDAE

Gobioides broussoneti Lacépède, 1799–1800

Zoophyl. **1** : 82, 277.
Cepola unicolor Gronovius (Gray), 1854 : 188. Holotype.

For a detailed discussion of the nomenclature of this specimen see Palmer & Wheeler (1955).

1853.11.~~12~~.81. 170 mm.

CALLIONYMOIDEA

CALLIONYMIDAE

Callionymus lyra L., 1758

Mus. Ichth. **1** : 23, 64. *Zoophyl.* **1** : 57, 206.
Uranoscopus lyra Gronovius (Gray), 1854 : 42.

Linnaeus based his name on descriptions in five earlier works, of which the *Museum Ichthyologicum* was the third. This specimen is therefore part of the type series.

1853.11.12.11. 164 mm. (Male.)

Callionymus lyra L., 1758

Mus. Ichth. **1** : 23, 65. *Zoophyl.* **1** : 57, 205.
Uranoscopus dracunculus (L.) Gronovius (Gray), 1854 : 42.

Although the name *dracunculus* was used by early authors for the female of *Callionymus lyra*, this specimen is a male.

1853.11.12.12. 169 mm.

Callionymus lyra L., 1758

Mus. Ichth. **1** : 21, 63. *Zoophyl.* **1** : 57, 204.
Uranoscopus micropterygius Gronovius (Gray), 1854 : 43. Holotype.

Linnaeus based his name *dracunculus* on the description in Gronovius (1754), and on a brief description given in Artedi (1738, **4** : 49). This specimen is therefore one of the type specimens of that species. *Callionymus dracunculus* is recognized by authors as a synonym for the female of *C. lyra*.

1853.11.12.13. 137 mm.

BLENNIOIDEA

ANARHICHADIDAE

Anarhichas lupus L., 1758

Mus. Ichth. **1** : 16, 44. *Zoophyl.* **1** : 131, 400.
Anarhichas lupus, Gronovius (Gray), 1854 : 188.

Linnaeus based this name on references to two earlier descriptions, one to Artedi (1738, **4** : 23), and the other to the description in the *Museum Ichthyologicum*. The latter is the only reference against which fin ray counts are given, and Artedi's account is very brief and generalized. This specimen is therefore part of the type series.

1853.11.12.27. 421 mm.

BLENNIDAE

Blennius cornutus L., 1758

Zoophyl. **1** : 76, 264.
Adonis cornutus, Gronovius (Gray), 1854 : 95.
1853.11.12.53. 121 mm.

Blennius ocellaris L., 1758

Adonis pavoninus Gronovius (Gray), 1854 : 93. Holotype.
1853.11.12.54. 128 mm.

Blennius cristatus L., 1758 Plate 29, fig. 4.

Mus. Ichth. **1** : 32, 75. *Zoophyl.* **1** : 76, 263, tab. 6, fig. 4.
Adonis cristatus, Gronovius (Gray), 1854 : 95.

Linnaeus based the name *Blennius cristatus* on the description of this specimen in the *Museum Ichthyologicum*, and it is therefore the holotype of that species.

1853.11.12.55. 48 mm.

Head length	13	(26)	Length of dorsal base	39	(81)
Snout length	5·5	(12)	,, ,, anal base	23	(48)
Snout to dorsal origin	12	(25)	Diameter of orbit	4	(9)
,, ,, anal origin	24	(50)	Body depth at pectoral origin	13	(26)
Maxillary length	5	(10)	,, ,, ,, anal origin	11	(24)

Dorsal XII.14. Anal 18. Pectoral 14.

Body naked, short and deep, with a deep head the profile of which is almost vertical; vertical fins long and moderately high; dorsal rising just posterior to the orbit and anal nearly opposite the mid-point of the body. The head is relatively large, its length nearly four in the standard length. and depth equal to or greater than, the greatest body depth. Mouth small, both jaws armed with a single row of small incisiform teeth, sixteen in the upper jaw, and fifteen in the lower. There is a single posterior caniniform tooth in the lower jaw. The eye is situated high on the head, about two in snout, and on the dorsal border of the orbit, there is a small branched cirrus. There is an extensive patch of cirri on the nape, originating above the centre of the orbit and extending to the origin of the first dorsal ray. The nostril also bears a small bunch of cirri.

Pectoral fin large, the longest ray nearly equal to the head length, and extending well past the anal origin. Pelvics are jugular, origin at a level mid-way between the orbit and the pectoral origin. The first twelve rays of the dorsal fin are simple, and rather shorter than the branched rays. The first two anal rays are short and were apparently fleshily thickened, the remainder are of equal height. The last dorsal and anal rays just reach the origin of the caudal which is regular and truncate.

Colour: Appears to have been uniformly dark brown dorsally, and rather lighter at the sides and ventrally. No colour pattern is visible.

It should be noted that the original description contained no reference to locality, and Linnaeus (1758 : 256) wrote " Habitat in Indiis ", although Pinto (1954) has redescribed the species from material collected in the Districto federal, Brazil, and claimed that this could be assumed to be the region in which the present specimen was collected.

Clinidae

Clinus superciliosus (L.), 1758

Blennius mycterizans Gronovius (Gray), 1854 : 97. Syntypes.

Although the Linnaean species *Blennius superciliosus* was based on a specimen described in the *Museum Ichthyologicum*, none of the present specimens agree sufficiently well with that description to be safely considered to be the original specimens.

1853.11.12.49.	143 mm.
1853.11.12.50.	205 mm.
1853.11.12.51.	224 mm.

Clinus ? superciliosus (L.), 1758

Blennius ignobilis Gronovius (Gray), 1854 : 98. Holotype.

This is not the specimen described in the *Museum Ichthyologicum* (**2** : 21, 173), which was 4·66 inches (120 mm.) long.

1853.11.12.52.	184 mm.

PHOLIDIDAE

Centronotus gunnellus (L.), 1758

Zoophyl. **1** : 78, 267.
Pholis gunnellus, Gronovius (Gray), 1854 : 99.
1853.11.12.148. 158 mm.

ZOARCIDAE

Zoarces viviparus (L.), 1758

Mus. Ichth. **1** : 65, 145. *Zoophyl.* **1** : 77, 265.
Enchelyopus viviparus, Gronovius (Gray), 1854 : 100.

The *Museum Ichthyologicum* was the third of five references quoted by Linnaeus under the name of *Blennius viviparus*. This specimen is therefore probably part of the original type material.

1853.11.12.122. 253 mm.

Zoarces viviparus (L.), 1758

This may be the specimen which Gray (in Gronovius (Gray), 1854) indicated was described as *Enchelyopus americanus* in the manuscript, but unfortunately the sheet on which these specimens were mounted has been cut in half, and the lower part which would have borne the Gronovius name, is missing. It is possible that the sheet was whole when Gray identified, it but we have no means of confirming this. If it is the type specimen of *E. americanus* (type locality—Oceano Americano), then one would expect that it would be referable to *Zoarces anguillaris* (Peck), 1804, but this is not the case. The dorsal and anal fin ray counts do not agree with those given for that species by Jordan & Evermann (1898 : 2457), although there is an indication that the colour pattern on the head of this specimen might be the same as that which is described for the American species.

1853.11.12.123. 175 mm.

OPHIDIIDAE

Ophidion barbatum L., 1758

Zoophyl. **1** : 131, 401.
Ophidion congrus Gronovius (Gray), 1854 : 164. Holotype.
1853.11.12.124. 508 mm.

STROMATEIDEA

Mupus ovalis (Valenciennes), 1833

This specimen was not apparently included in the manscript, nor does its sheet bear a Gronovius name.

1853.11.12.46. 57 mm.

ANABANTOIDEA

ANABANTIDAE

Trichogaster trichopterus (Pallas), 1769.

Stethochaetus biguttatus Gronovius (Gray), 1854 : 174. Holotype. " Habitat in India ".

This specimen was discovered whilst curating the dry collection of *Stethojulis*, with which genus it had been confused. The Gronovius name was a *species inquirendae* until Fraser-Brunner (1952) published an account of its discovery ; he was, however, not correct in stating that " its identity has not been established up to the present time ", for Gray (1854*a*) in listing the Gronovius names which would have had priority had the manuscript been published shortly after it was written, included *Stethochaetus* is a synonym of *Trichopus* Lacépède, in which genus this species was then included.

Fraser-Brunner has pointed out the confusion that resulted from the ignorance of the identity of this name. Jordan & Seale (1926) had used the name *Stethochaetus* to replace *Heterothrissa* (Günther), an engraulid fish, but, to do this had to alter the published facts to fit their theory. They assumed that the number of anal rays (36 in the manuscript) was a misprint for 63, ignored the statement that the first eleven rays were stated to be aculeate, and added " the pectoral filament is said to be as long as the body ", whereas, the description quite clearly states that the filament was in place of the pelvic fin. Probably Jordan was responsible for this curious perversion of Gronovius's description, for earlier (1919 : 259) he had stated, " *Stethochaetus* Gronow . . . a synonym of Setapinna Sw. (*Telara* Gthr.) ". Fowler (1941) followed Jordan & Seale in applying *Stethochaetus* as a subgenus of *Setapinna*.

This specimen is loose and no longer mounted on its sheet of paper, which was possibly its condition when the collection was purchased, as it has a label in Gray's hand tied to it. Fortunately, it can be identified for certain as Gronovius material by the original label which is stuck on the back of the skin. It has suffered some damage to the tip of the caudal rays, the pelvic filament, and the head and snout.

1853.11.12.77. 89 mm.

MUGILOIDEA

MUGILIDAE

Mugil ?ramada Risso, 1826

Mus. Ichth. **1** : 35, 85. *Zoophyl.* **1** : 129, 397.
Mugil cephalus (*non* L.) Gronovius (Gray), 1854 : 162.
1853.11.12.26. 266 mm.

ATHERINIDAE

Atherina presbyter Cuv. & Val., 1829

Mus. Ichth. **1** : 23, 66. *Zoophyl.* **1** : 130, 399.
Atherina hepsetus (*non* L.) Gronovius (Gray), 1854 : 190.

In Gronovius (1754) the anal fin was stated to have ten rays, which is possibly the reason why Günther (1861 : 392) suggested that the Gronovius specimen had been damaged. However, he failed to recognize this specimen as the *Atherina* described by Gronovius, and a careful count of the rays in that fin shows that there are sixteen, although damage makes the last rays difficult to count.

The description in the *Museum Ichthyologicum* was used by Linnaeus as one of three references on which he based his *Atherina hepsetus*. The other references were to Artedi (1738, **5** : 117), and to Hasselquist (1757 : 382). There seems to be no doubt that the specimen described by Artedi, was in fact, the *Atherina hepsetus* of authors, although the inclusion of the Gronovius description in the type series made the Linnaean species composite. There is no necessity for any nomenclatural change, however, for the species appears to have been adequately restricted to the *hepsetus* of authors by Bloch (1794 : 158, pl. 393, fig. 3.).

1853.11.12.79. 65 mm.

POLYNEMOIDEA

Polynemidae

Polynemus hexanemus Cuv. & Val., 1829

Polynemus senarius Gronovius (Gray), 1854 : 176. Holotype.
1853.11.12.59. 118 mm.

SCLEROPAREI

Scorpaenidae

Scorpaena sp.

Mus. Ichth. **1** : 46, 103. *Zoophyl.* **1** : 87, 290.
Scorpaena barbata Gronovius (Gray), 1854 : 116. Holotype.

Linnaeus's species *Scorpaena scrofa* was based on two references, the *Museum Ichthyologicum* being one. The other is to Artedi's (1738, **4** : 47, **5** : 76) description. The status of this Linnaean species is most confusing for Artedi gave no real description and only a pectoral fin ray count. Linnaeus was obviously dubious that the description by Gronovius was of the some species, for he put a mark of interrogation after the reference. I am doubtful if this specimen is referable to the *Scorpaena scrofa* of authors (it has seventeen pectoral rays, *scrofa* has 19–20 (Norman, 1935)), and it seems desirable that this problem should receive attention in some future revision of the genus.

1853.11.12.8. 63 mm.

Dendrochirus brachyptera (Cuvier), 1829

Mus. Ichth. **2** : 33, 191. *Zoophyl.* **1** : 89, 294.
Scorpaena volitans (*non* L.) Gronovius (Gray), 1854 : 119.

There is a figure, probably of *Pterois volitans* but labelled *Perca* ******** in the manuscript, but it does not represent the present specimen.

Linnaeus's name *Gasterosteus volitans* (= *Pterois volitans*) was primarily based on the description given by Gronovius in the *Museum Ichthyologicum*, for this is the only reference against which fin ray counts are given. The other references were to Willughby's *Ichthyologicum* (1686 : app. 1, tab. 2), Ruysch (1710 : 39, tab. 2, fig. 3), and Valentyn (1726 : 413, 415). There is no doubt that the specimen described in 1756 by Gronovius, was the present skin, for the counts and measurements that he gives are identical with those made on the specimen, and it must therefore be part of the type series of *Pterois volitans* (L.). Fortunately, of the other descriptions Linnaeus cited, that of Ruysch, and possibly also that of Willughby, can be considered to be compiled from specimens of *Pterois*. There is therefore no necessity to interfere with the accepted nomenclature of this well known species.

1853.11.12.9. 109 mm.

Head length	45 (41)	Snout to first dorsal	37 (34)
Maxillary length	19 (17)	,, ,, anal origin	82 (75)
Diameter of orbit	13 (12)	Length of dorsal base	69 (63)
Length of snout	14 (13)	,, ,, anal base	17 (16)
Depth of suborbital	15 (14)	,, ,, pectoral fin	57 (52)
,, ,, caudal peduncle	13 (12)		

Dorsal XIII.10. Anal III.6. Pectoral 17.

Body moderately deep, about 2·25 in standard length, head relatively large and very rugose. Mouth large, maxillary extending to below pupil ; the eye is large and equals the snout which is ·33 of the head length. There is a pronounced spiny ridge across the cheek, and this ends opposite three flattened spines on the preoperculum. The upper edge of the orbit is well armed with five large spines or groups of spines and this series is continued in a ridge across the upper margin of the operculum ; there are also two groups of spines on the nape. This specimen still shows the long fleshy orbital tentacle and a shorter one on the edge of the nostril.

Dorsal fin long, the spines both long and pungent, the soft rays are much shorter, the longest only a little more than half the length of the longest spine. The rays in both the pelvic and pectoral fins are elongate, particularly in the latter, where they are almost equal to the body length. Head and body covered with large ctenoid scales, about fifty in the lateral line and eight above it to the base of the eighth dorsal spine. Pectoral rays two to nine are branched.

Colour : Body and vertical fins marked with six conspicuous dark wide vertical stripes, between which the colour is light golden-brown. These wide dark bands alternate on the back with shorter, narrower bands within the light stripes. The membrane of the pectoral and pelvic fins appears dark, while the fin rays are light. The conspicuous vertical stripes on the body, extend to the head, one wide stripe crossing the upper edge of the operculum to the pectoral base, and another running through the eye and vertically down the cheek. There appears to be another stripe running across the snout to the end of the maxillary.

Sebastichthys capensis (Gmelin), 1788 Plate 32.

Zoophyl. **1** : 88, 293.
Perca afra Gronovius (Gray), 1854 : 113. Holotype.

The description of this specimen in the *Zoophylacium* is the only one quoted by Gmelin ; this is thus the holotype of this species.

1853.11.12.? 80. 229 mm.

Head length	100 (44)	Length of snout	29 (13)
Depth of body	100 (44)	Snout to first dorsal	88 (38)
Length of maxillary	43 (19)	,, ,, anal fin	170 (74)
Depth of maxillary	14 (6)	Depth of caudal peduncle	22 (10)
Diameter of orbit	25 (11)	Length of dorsal base	133 (60)
Length of anal base	30 (13)	Length of pectoral fin	61 (26)

Dorsal XII.13. Anal III.6. Pectoral 18.

Body and head deep and thickset, head 2·25 into standard length. Eye large, nearly four into head, its hind edge vertically above the end of the maxillary when mouth is closed. Head moderately well armed, four large spines at angle of preoperculum, of equal size and equally spaced ; tip of operculum angulate, with two flattened, partially concealed spines anteriorly. Remains of the head armour can be seen in this skin, and consist of a large supra-orbital spine, and behind it two smaller spines lying in the same plane ; there is an equally large spine on the nape.

The body is broadly ovate and covered with medium sized scales, about forty-two in the lateral line, and eight above it to the seventh dorsal spine. The spinous dorsal origin is above the pelvic origin, while the pectoral fin rises below the third dorsal spine ; the first anal spine is directly beneath the origin of the dorsal fin. The first two and the lower nine pectoral rays are simple. The head, with the exception of the lower jaw, is closely scaled. Both jaws armed with numerous fine teeth in a broad band in front, but narrower laterally.

Colour : Head darker than the rest of the body, the dorsal surface of the body darker than the belly. There are several small light blotches on the back, each smaller than the orbit, and the edge of the dorsal fin membrane appears light. Lower rays of the pectoral fin have dark tips, and there appears to be a darker central spot in many of the scales on the body. Otherwise the colour is mainly light golden-brown.

TRIGLIDAE

Trigla gurnardus L., 1758

Mus. Ichth. **1** : 44, 101. *Zoophyl.* **1** : 84, 283.
Trigla aspersa Gronovius (Gray), 1854 : 105. Holotype.

The description in the *Museum Ichthyologicum* was referred to by Linnaeus under the name of *Trigla gurnardus ;* he also gave Artedi's (1738, **4** : 46) description, and in addition, apparently had a specimen in his own collection.

1853.11.12.15. 243 mm.

Trigla lucerna L., 1758

Mus. Ichth. **1** : 44, 100. *Zoophyl.* **1** : 84, 284.
Trigla cuculus (*non* L.) Gronovius (Gray), 1854 : 105.

The description of this specimen in the *Museum Ichthyologicum* was referred to by Linnaeus, as was a description by Artedi (1738, **4** : 45). The present specimen is therefore part of the type series.

1853.11.12.16. 221 mm.

CONGIOPODIDAE

Congiopodus torvus (Gronovius), 1772 Plate 33.

Blennius torvus Gronovius, 1772 : 47, tab. 3. Holotype.
Cephalinus glaber Gronovius (Gray), 1854 : 159. Holotype. " . . . in Mari Indico ".

Despite the fact that the name *Blennius torvus* was validly published in 1772, and the species was adequately described, recent authors persistently attribute it to Walbaum (1792 : 187) who, however, quite plainly referred to the Gronovius description of the fish.

1853.11.12.99. 434 mm.

Head length	113 (26)	Length of anal base	46 (10)
Snout length	57 (13)	,, ,, pectoral fin	111 (26)
Orbit diameter	27 (6)	Greatest body depth	122 (28)
Snout to pectoral base	94 (22)	Depth of caudal peduncle	24 (5)
,, ,, anal origin	276 (63)	Length of third dorsal spine	146 (33)

Dorsal XXI.13. Anal II.7. Pectoral 9.

Body laterally compressed, high, with steep profile. Greatest depth at level of pelvic fin base, posterior to which the depth gradually decreases. Head and body naked, skin smooth, a series of pores in the lateral line, sixteen in number, follows the dorsal profile at a height of less than ·33 of the body depth below the profile. Head protected by rugose plates, mainly confined to the upper half, with narrow plates bordering the orbit, above, below and behind; and a more massive plate above the pre-operculum and below the fourth and fifth dorsal spines. A small plate is situated on the upper angle of the operculum. Orbit large, nearly 1·5 times in snout, but the eye diameter is about half that of the orbit, although this may be due to shrinkage. Mouth protractile, gape small, about six in head length, both jaws lined with extensive bands of villiform teeth. Lower part of head smooth and unarmoured. (Part of the snout immediately in front of the eye is missing.)

Dorsal fin origin above pupil, single, its anterior part composed of strong stout spines, of which the first seven are very long; the third spine is longest and about 1·3 times the head length. Dorsal rays not greatly produced, about two in head, first three simple, the rest all branched. Caudal fin small slightly forked, one of the the upper rays greatly swollen (hyperosteosis). The anal fin is short based; its longest rays slightly longer than the branched dorsal rays. Pectoral and pelvic fins both long, almost equal, pectoral base just anterior to that of the pelvic; the length of the pelvic equals the head.

Colour: A uniform dark brown, with only the membrane of the high spinous dorsal and the pectoral and pelvic fins darker, especially the latter where the membrane is almost black.

COTTIDAE

Cottus scorpius L., 1758

Mus. Ichth. **1** : 46, 104. *Zoophyl.* **1** : 78, 268.
Cottus scorpius, Gronovius (Gray), 1854 : 102.

The description in the *Museum Ichthyologicum* was quoted by Linnaeus in his description of *Cottus scorpius*, although there are references also to two of his own works (Linnaeus 1751 : 325; 1749, **1** : 70), and to a description by Artedi (1738, **3** : 86; **4** : 49).

1853.11.12.17. 143 mm.

AGONIDAE

Agonus cataphractus (L.), 1758

Mus. Ichth. **1** : 46, 105. *Zoophyl.* **1** : 79, 271.
Cottus cataphractus, Gronovius (Gray), 1854 : 103.
1853.11.12.18. 100 mm. (Lateral surface.)
1853.11.12.19. 136 mm. (Dorsal surface.)

CYCLOPTERIDAE

Cyclopterus lumpus L., 1758

Mus. Ichth. **1** : 56, 127. *Zoophyl.* **1** : 54, 197.
Cyclopterus lumpus, Gronovius (Gray), 1854 : 39.

Under this name Linnaeus quoted four references, two were to descriptions in his own earlier works (1749, **1** : 57 ; 1746 : 275), one was to Artedi's (1738, **4** : 62) description, and the fourth was to the *Museum Ichthyologicum*. Of these references the only adequate description with fin ray counts included, is that of Gronovius. This specimen is therefore part of the original type series.

1853.11.12.183. 371 mm.

LIPARIDAE

Liparis liparis (L.), 1758 Plate 29, fig. 2.

Mus. Ichth. **2** : 9, 157. *Acta Helvetica* 1760, **4** : 265, 165, tab. 13, " Hab. ad littora nostra marina ". *Zoophyl.* **1** : 55, 198.
Cyclogaster liparis, Gronovius (Gray), 1854 : 40.

The original drawing of the figure in Gronovius (1760) is still preserved in the manuscript.

The name *Cyclogaster liparis* was based on two references, namely to Artedi (1738, **5** : 117) and to Gronovius's descriptions of 1760 and 1756. The reference to Artedi, who gave no more than a list of synonyms and not a description, was, however, qualified by a question mark, and Linnaeus was obviously doubtful of its application to the specimen described by Gronovius. It is obvious then,that this specimen should be regarded as the type of the species.

1853.11.12.182. 85 mm.

Head length	24 (27)	Snout to anal origin	47 (53)
Snout length	9 (10)	Height of dorsal fin	10 (11)
Orbit diameter	3 (3)	Maxillary length	11 (12)
Snout to dorsal origin	24 (27)	Length of disc	13 (15)

Dorsal 35. Anal 30. Pectoral 33.

Body short and deep, with a heavy depressed, blunt head. Mouth broad, gape wide, jaws bearing several rows of very small teeth, each with a high central point and two weaker lateral lobes. At the tip of the jaw these rows of teeth are greatly increased. The snout is blunt and round, the lower jaw in included, gape extends to front edge of eye. The first rays of the dorsal fin are considerably shorter than the hind rays, the fifth and sixth rays being the shortest. Posteriorly the rays rise evenly and are longest at approximately the twentieth to the twenty-fifth rays, after which they decrease in length ; the last ray is joined to the caudal by a short membrane. Caudal fin short ; truncate, its rays a little longer than those in the dorsal fin ; the connection with the last dorsal ray only involves the posterior quarter of the tail. Anal fin similar to the dorsal but shorter.

The disc in this specimen is folded over on itself and against the pectoral fin, rendering it almost impossible to measure exactly. The figure given above (13 mm.) is as near an approximation as could be made.

Colour: A nearly uniform golden-brown, dorsally on the head darker. Some indistinct markings on the dorsal and anal fins appear to be the remains of a fairly general darker brown mottling which ran in irregular lines on those fins. (Recent collecting has shown that the colour pattern of this species is very variable within each locality, and undue reliance cannot be placed on it as of taxonomic importance, as has been suggested by authors.)

THORACOSTEI

GASTEROSTEIDAE

Gasterosteus aculeatus L., 1758

Mus. Ichth. **1** : 49, 111. *Zoophyl.* **1** : 134, 405.
Gasterosteus aculeatus, Gronovius (Gray), 1854 : 167.
1853.11.12.47. 52 mm.

Pygosteus pungitus (L.), 1758

Mus. Ichth. **1** : 50, 122. *Zoophyl.* **1** : 134, 406.
Gasterosteus pungitus, Gronovius (Gray), 1854 : 167.
1853.11.12.212. 29 mm.
1853.11.12.213. 31 mm.
1853.11.12.214. 33 mm.

Spinachia spinachia (L.), 1758.

Mus. Ichth. **1** : 50, 133. *Zoophyl.* **1** : 134, 407.
Gasterosteus marinus Gronovius (Gray), 1854 : 168. Holotype.
1853.11.12.48. 128 mm.

HETEROSOMATA

SCOPTHALMINAE

Scopthalmus maximus (L.), 1758

Mus. Ichth. **2** : 10, 159. *Zoophyl.* **1** : 74, 254.
Pleuronectes rhombus (*non* L.) Gronovius (Gray), 1854 : 90.

Linnaeus referred to descriptions in four earlier works, of which one was the *Museum Ichthyologicum*, this specimen is therefore part of the original type series. The other references were to Linnaeus (1745 : 178; 1746 : 298), and Artedi (1738, **4** : 18). There are two specimens of this species in the Linnaean collection (Günther, 1899).

1853.11.12.135. 173 mm.

PLEURONECTIDAE

Hippoglossus hippoglossus (L.), 1758

Mus. Ichth. **2** : 10, 158. *Zoophyl.* **1** : 73, 247.
Pleuronectes hippoglossus, Gronovius (Gray), 1854 : 87.

Linnaeus based his name on three earlier descriptions, in Linnaeus (1746 : 302), Artedi (1738, **4** : 17) and Gronovius *Museum Ichthyologicum*. This specimen is therefore part of the type series.

1853.11.12.127. 340 mm.

Limanda limanda (L.), 1758

Mus. Ichth. **1** : 15, 41. *Zoophyl.* **1** : 73, 249.
Pleuronectes linguatula L. (part) Gronovius (Gray), 1854 : 88.

The Linnaean name *Pleuronectes linguatula* was based on references to two earlier descriptions, by Artedi (1738, **4** : 17) and Gronovius (1754) respectively. The present specimens are thus part of the type series. Norman (1934) has already pointed out that this Linnaean species is composite, but he considered that Schneider (inBloch, 1801) restricted the use of the name adequately, and that no nomenclatural change was necessary.

1853.11.12.128.	143 mm.	(Ocular side.)
1853.11.12.129.	134 mm.	(Blind side.)

Pleuronectes platessa L., 1758

Mus. Ichth. **1** : 14, 36. *Zoophyl.* **1** : 72, 246.
Pleuronectes platessa, Gronovius (Gray), 1854 : 87.

The description in the *Museum Ichthyologicum* was mentioned by Linnaeus under this name, as the fourth of four references. These specimens are therefore probably part of the original type series.

1853.11.12.130.	211 mm.
1853.11.12.131.	203 mm.

Glyptocephalus cynoglossus (L.), 1758

Plate 34.

Mus. Ichth. **2** : 11, 39. *Zoophyl.* **1** : 74, 252.
Pleuronectes cynoglossus, Gronovius (Gray), 1854 : 88.

In the *Museum Ichthyologicum* the total length of the specimen described was given as fourteen inches, which agrees with the present specimen. Linnaeus referred to only one earlier description, namely that in the *Museum Ichthyologicum*, and this specimen is therefore the holotype of the species. Norman (1934 : 366) listed this specimen as having been examined, although he also remarked that the type could not be traced.

1853.11.12.126.	317 mm.

Head length	54	(17)	Width of body	96	(31)
Maxillary length	11	(3·5)	Snout to anal origin	80	(26)
Snout length	9	(3)	Longest anal ray	25	(8)
Orbit diameter	14	(4)	,, pectoral ray	34	(11)
Length of lower jaw	17·5	(6)	Length of caudal fin	58	(19)

Dorsal 112. Anal 102. Caudal 16.

Body regularly ovoid, width nearly three in length. Head moderately large, about 5·5 in standard length, lower jaw protruding. Eyes large, the lower slightly in advance of upper ; interorbital ridge narrow and apparently low. Maxillary extends to below the edge of the lower eye, its length about five in head length ; teeth in a single row in each jaw, blunt and rather compressed.

The pectoral fin is moderately long but is less than the head length, its origin is directly above the pelvic origin. Anal fin origin immediately behind the pelvic, the rays longest between the eleventh and the fifty-second rays, after which they decrease in size gradually; longest ray equals nearly half the head. The dorsal fin is a similar shape, its origin above the centre of the upper eye, and the longest rays between the thirtieth and the seventieth, equal the anal fin rays in length.

The body is covered with rather large cycloid scales, which in this specimen are nearly all missing; there appear to be between 110 and 115 in the lateral line but due to the pectoral fin overlying it and the damage to the scales, it is not possible to count more accurately than this. The lateral line is almost straight but with a slight curve upwards in the region of the pectoral fin.

Colour: No general colour pattern visible except for the usual golden-brown of the covering varnish; the tips of the pectoral and caudal fins, and possibly the vertical fins also, appear to be rather darker than the body.

Platichthys flesus flesus (L.), 1758

Mus. Ichth. **1** : 15, 40. *Zoophyl.* **1** : 73, 248.
Pleuronectes flessus, Gronovius (Gray), 1854 : 88.

Linnaeus referred to five earlier works under this name, and the *Museum Ichthyologicum* was the fourth of them. These specimens are therefore probably part of the original type series. The other references were to descriptions in Artedi (1738, **3** : 59; **4** : 17) and Linnaeus (1751 : 326; 1746 : 300).

1853.11.12.133.	143 mm.	(Ocular side.)
1853.11.12.132.	139 mm.	(Reversed specimen, ocular side.)
1853.11.12.134.	152 mm.	(Blind side.)

Soleidae

Solea solea (L.), 1758

Mus. Ichth. **1** : 14, 37. *Zoophyl.* **1** : 74, 251.
Pleuronectes solea, Gronovius (Gray), 1854 : 89.
1853.11.12.125. 146 mm.

DISCOCEPHALI

Echeneididae

Echeneis naucrates L., 1758

Mus. Ichth. **1** : 13, 34, " . . . mare Atlanticum ". *Zoophyl.* **1** : 75, 257.
Echeneis fusca Gronovius (Gray), 1854 : 92. Holotype.
1853.11.12.117. 213 mm.

PLECTOGNATHI

Balistidae

Balistes vetula L., 1758

Zoophyl. **1** : 53, 195.
Balistes equestris Gronovius (Gray), 1854 : 31. Holotype.
1853.11.12.190. 113 mm.

Balistes carolinensis Gmelin, 1788

Mus. Ichth. **1** : 53, 117. *Zoophyl.* **1** : 51, 187.
Balistes capriscus Gronovius (Gray), 1854 : 30. Holotype.

Gmelin founded his species *Balistes capriscus* on a series of earlier descriptions and figures, but primarily on the two descriptions by Gronovius as cited above. Günther (1870 : 217) claimed that this specimen was the type of Gmelin's *capriscus*, and in this he was largely correct, for the remaining twelve references are all apparently copied straight from the " synonymy " given by Gronovius.

1853.11.12.187. 43 mm.

Balistes carolinensis Gmelin, 1788

Balistes carolinensis Gronovius (Gray), 1854 : 29. Holotype.

Although this specimen is not labelled as such it is very probable that it was part of Garden's collection. The note in the manuscript " Anglis Carolinam inhabitantibus audit *Rabbit* Fish " also suggests this. The Gronovius (Gray) name *carolinensis* appears to be an independent proposal to that of Gmelin.

1853.11.12.186. 251 mm.

Balistes niger Park, 1794

Balistes verrucosus Gronovius (Gray), 1854 : 33. Holotype, " . . . in Mari Indico ".
1853.11.12.194. 259 mm.

Balistapus undulatus (Park), 1794

Balistes porcatus Gronovius (Gray), 1854 : 32. Holotype, " . . . in mari Indico ".
1853.11.12.192. 188 mm.

Xanichthys ringens (L.), 1758

Zoophyl. **1** : 53, 196.
Balistes nitidus Gronovius (Gray), 1854 : 36. Holotype, " in Oceano Americano ".

The description in the *Zoophylacium* was the only reference given by Gmelin (1788). under his name *Balistes curassavicus*, this specimen is therefore the holotype of that species, and that name a synonym of *Xanichthys ringens*.

1853.11.12.189. 76 mm.

Xanichthys ringens (L.), 1758

Zoophyl. **1** : 52, 190.
Balistes notatus Gronovius (Gray), 1854 : 36. Holotype.
1853.11.12.188. 133 mm.

Canthidermis maculatus (Gmelin), 1788

Zoophyl. **1** : 52, 192. " . . . in Oceano Americano ".
Balistes rufus Gronovius (Gray), 1854 : 36. Holotype.

This specimen is also the holotype of Gmelin's *Balistes americanus*, for the description in the *Zoophylacium* was the only one quoted under that name.

1853.11.12.193. 32 mm.

MONACANTHIDAE

Monacanthus chinensis (Bloch), 1786

Balistes granulosus Gronovius (Gray), 1854 : 34. Holotype, " . . . in mari Indico ".

This is not the specimen described in the *Museum Ichthyologicum* to which Bloch (1786) and Gmelin (1788) referred, for the length was given there as two inches.

There is a drawing labelled *B. granulosus* in the manuscript, which is not of the present specimen, it may represent the earlier one.

1853.11.12.191. 110 mm.

TETRODONTIDAE

Amblyrhynchotes honckenii (Bloch), 1785

Holocanthus lagocephalus (*non* L.) Gronovius (Gray), 1854 : 25.

This is not the specimen described in the *Zoophylacium* (**1** : 49, 183) as the measurements there are inconsistent with those made on this specimen.

1853.11.12.174. 178 mm.

Lagocephalus laevigatus (L), 1766

Holocanthus melanothos Gronovius (Gray), 1854 : 24. Holotype.

This specimen is part of Garden's Carolina collection (number 17). Jordan & Evermann (1898) state that the Gronovius species was " based on *Tetrodon laevigatus* of Linnaeus " which is plainly incorrect. Linnaeus's type specimen came from the same collector, however, which may have led to this confusion.

1853.11.12.175. 335 mm.

PEDICULATI

ANTENNARIOIDEA

ANTENNARIDAE

Histrio histrio (L.), 1758

Mus Ichth. **1** : 53, 116. " Mare Atlanticum, Hispanicum atque Indicum, ubi inter Algas multoties reperitur ". *Zoophyl.* **1** : 58, 208. " Habitat in Mari Fucoso ".
Lophius histrio, Gronovius (Gray), 1854 : 48.
1853.11.12.92. 36 mm.

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PLATE 26

Laurens Gronovius and his sons Johannes and Samuel ; from a portrait by Isaac la Fargue van Nieuwland (*ca.* 1774), now in the Stedelijk Museum (Lakenhal), Leiden, and published by permission of the Director, Mr. J. N. van Wessem.

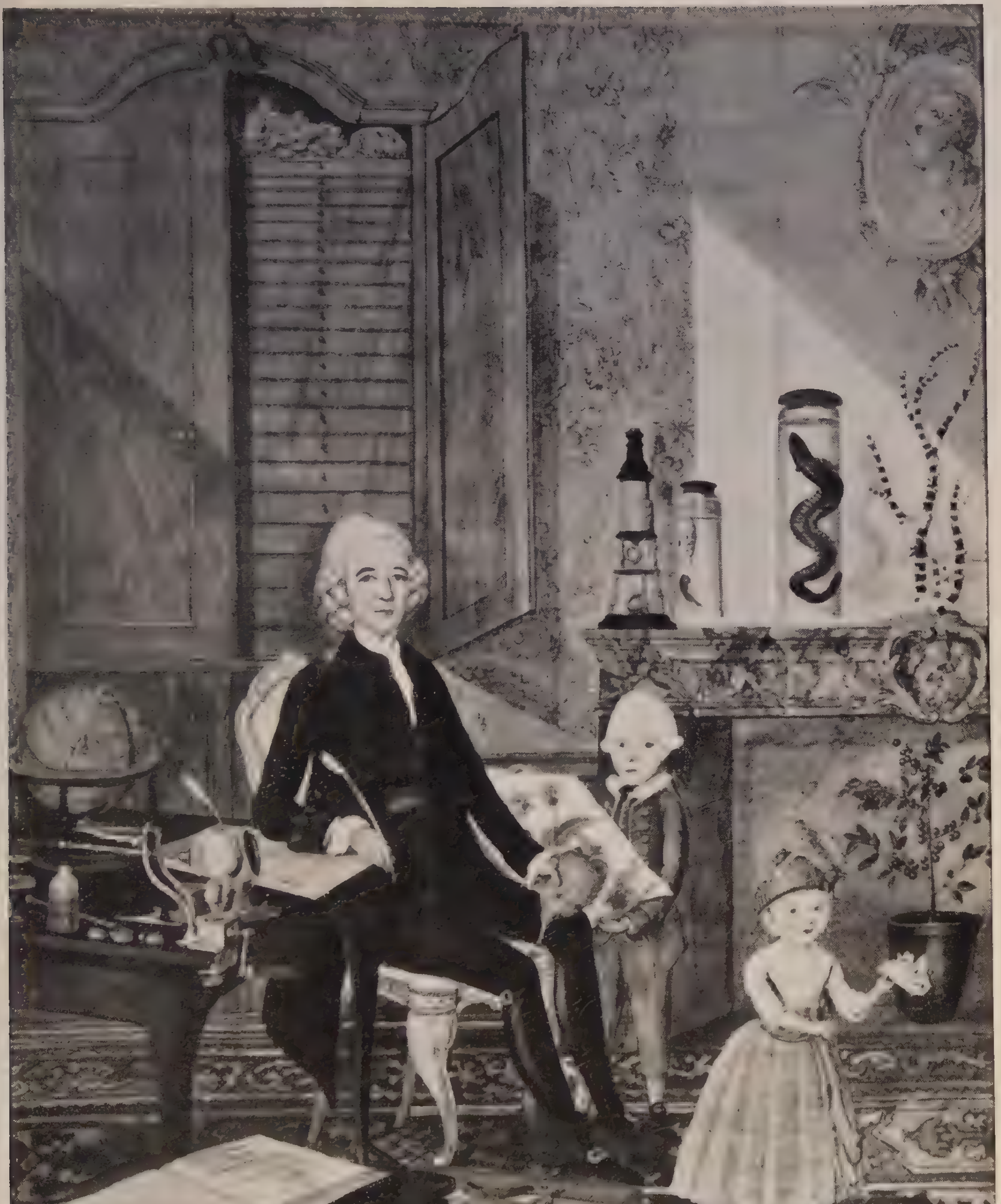
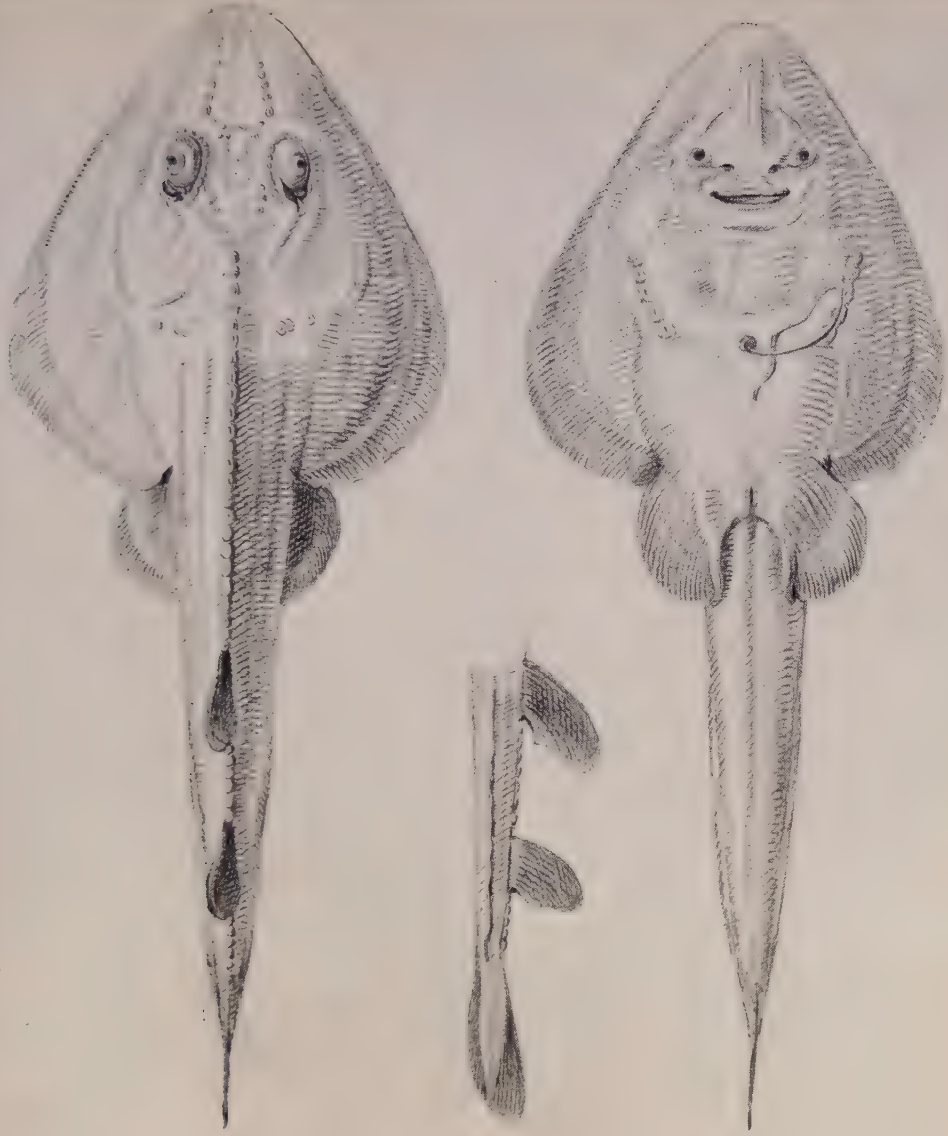


PLATE 27

The illustration and description of *Raja rhinobatus* in the Gronovius manuscript.



V Raja Rhinobatus +

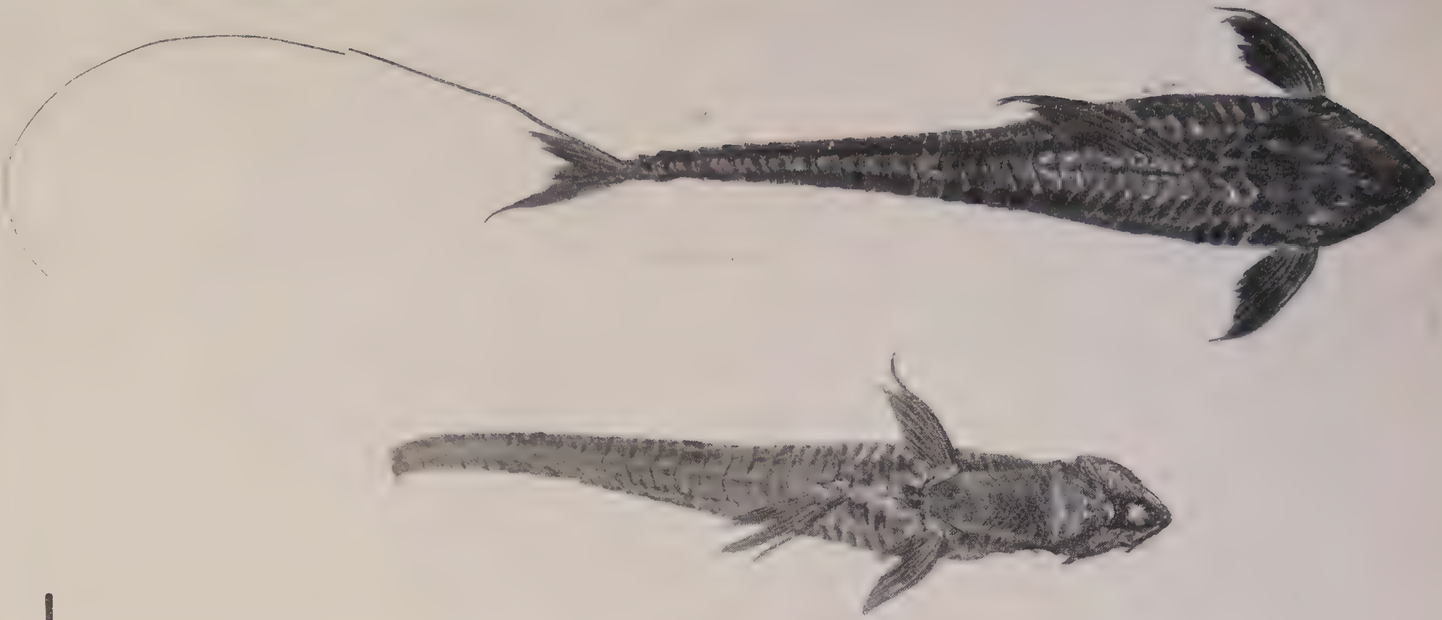
Raja rostro acuminato: alis subangulosis: cauda crassa dilatata praelonga: dorso
caudaque serie solitaria aculeorum.
Rhinobatus sive Squatino raja. Fab. Columna Ekphras. p. 101. tab. 103.

Habitat in Mari Mediterraneo.
Habetur pro Cithara vel κίθαρος Aristotelis a Columna et Planco.
Discrepat a Leucobato alis angustioribus: rostro longiore acutiore: Cauda multo
longiore, latiore: et pinnis ventralibus remotioribus ab alis. Color dorsi subflavus.
Cutis partis superioris scabra.

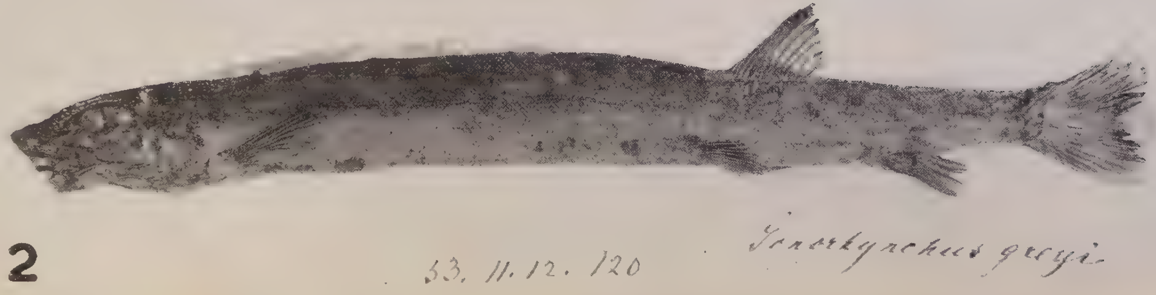
PLATE 28

Fig. 1. *Loricaria cataphracta* L.

Fig. 2. *Gonorynchus gonorhynchus* (L.). Holotype.



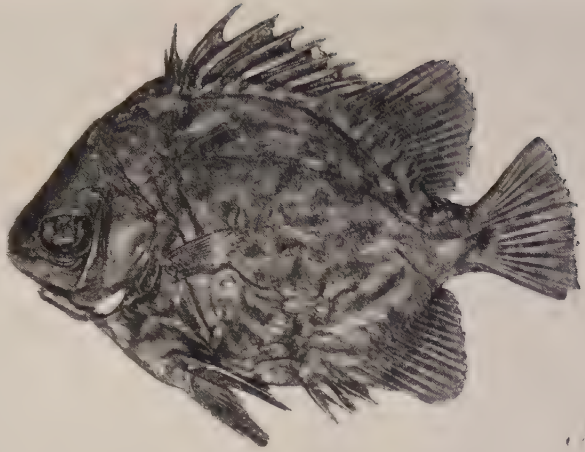
1



2

PLATE 29

FIG. 1. *Scatophagus argus* (L.).
FIG. 2. *Liparis liparis* (L.). Holotype.
FIG. 3. *Gasteropelecus sternicla* (L.). Holotype.
FIG. 4. *Blennius cristatus* L. Holotype.



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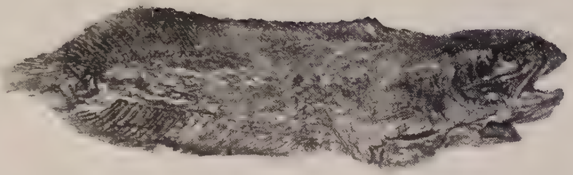

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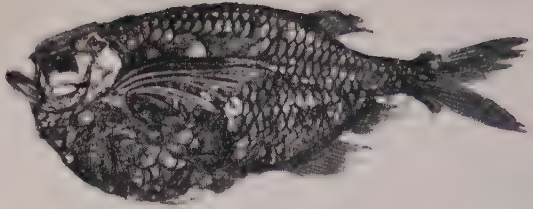

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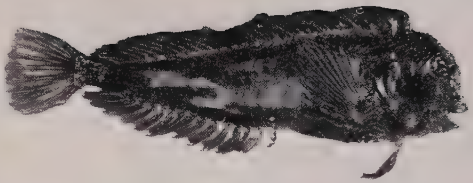

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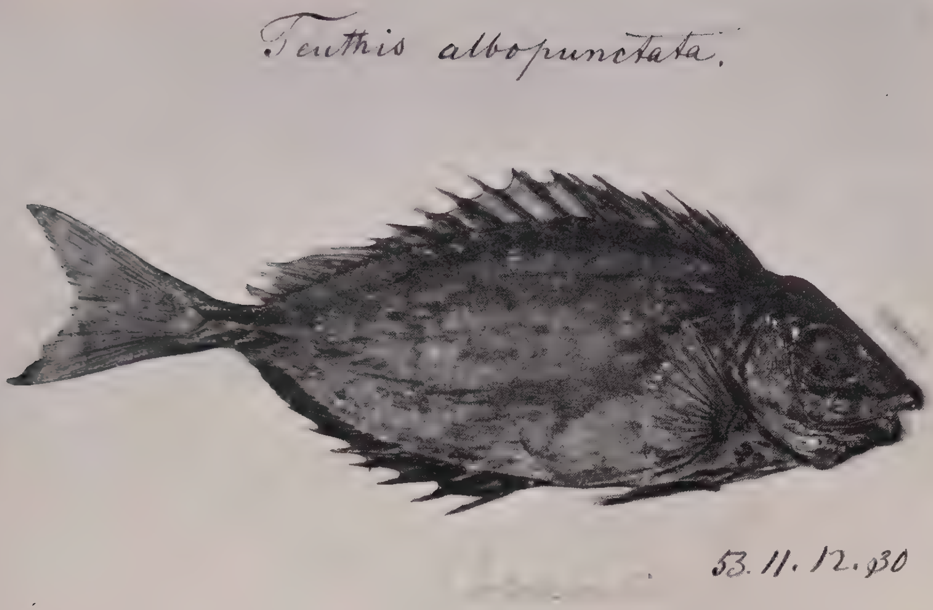
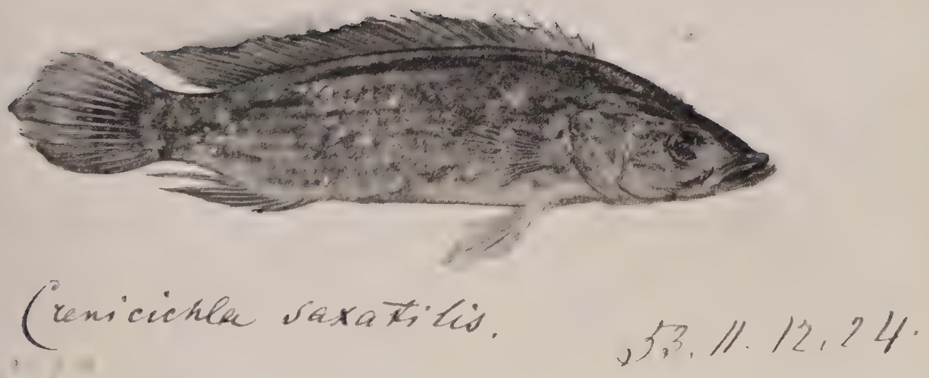
PLATE 30

FIG. 1. *Siganus javus* (L.). Holotype.

FIG. 2. *Crenicichla saxatilis* (L.). Holotype.


Teuthis albopunctata.
53.11.12.30

1


Crenicichla saxatilis.
53.11.12.24.

2

PLATE 31

Acanthurus hepatus (L.). Holotype.

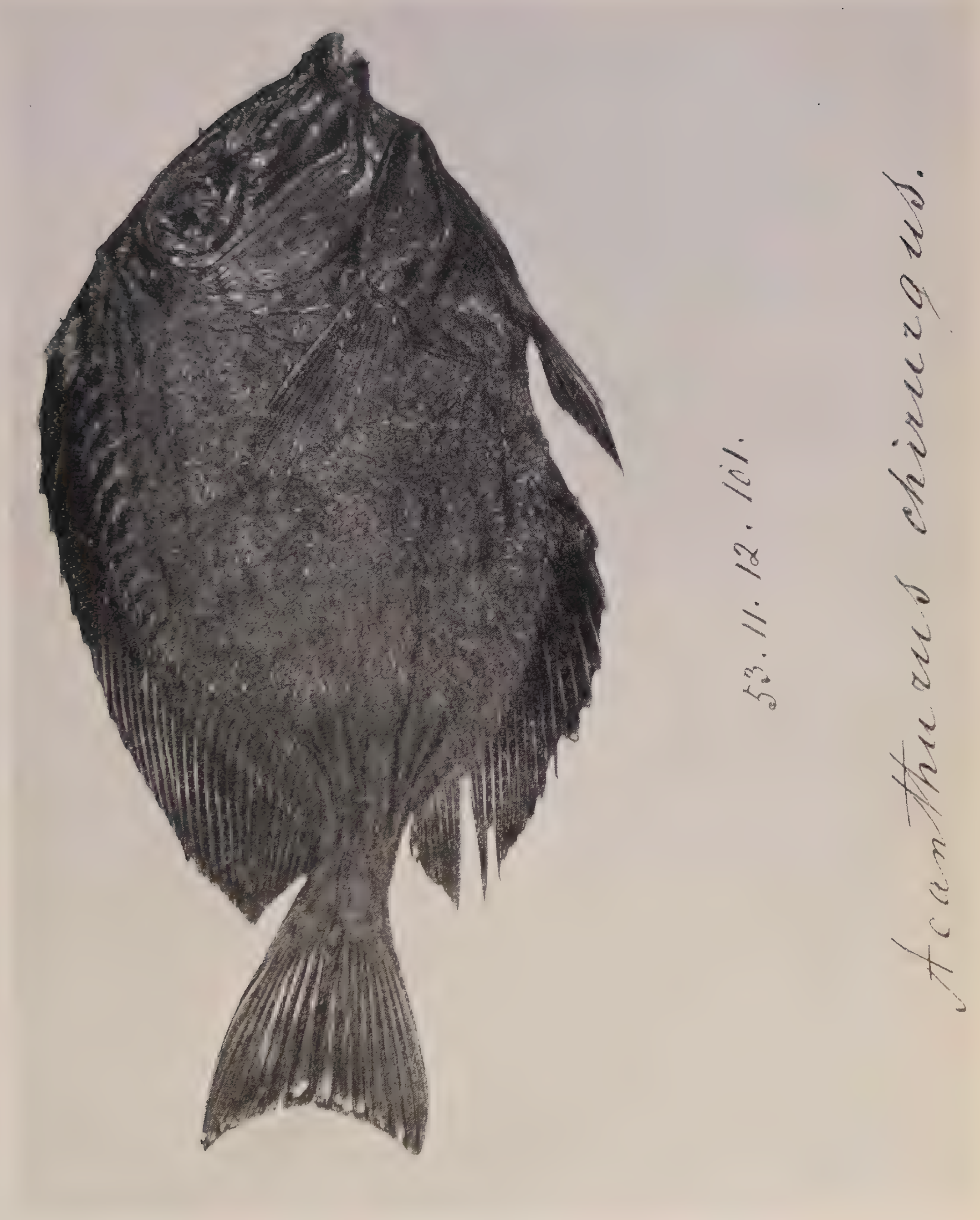
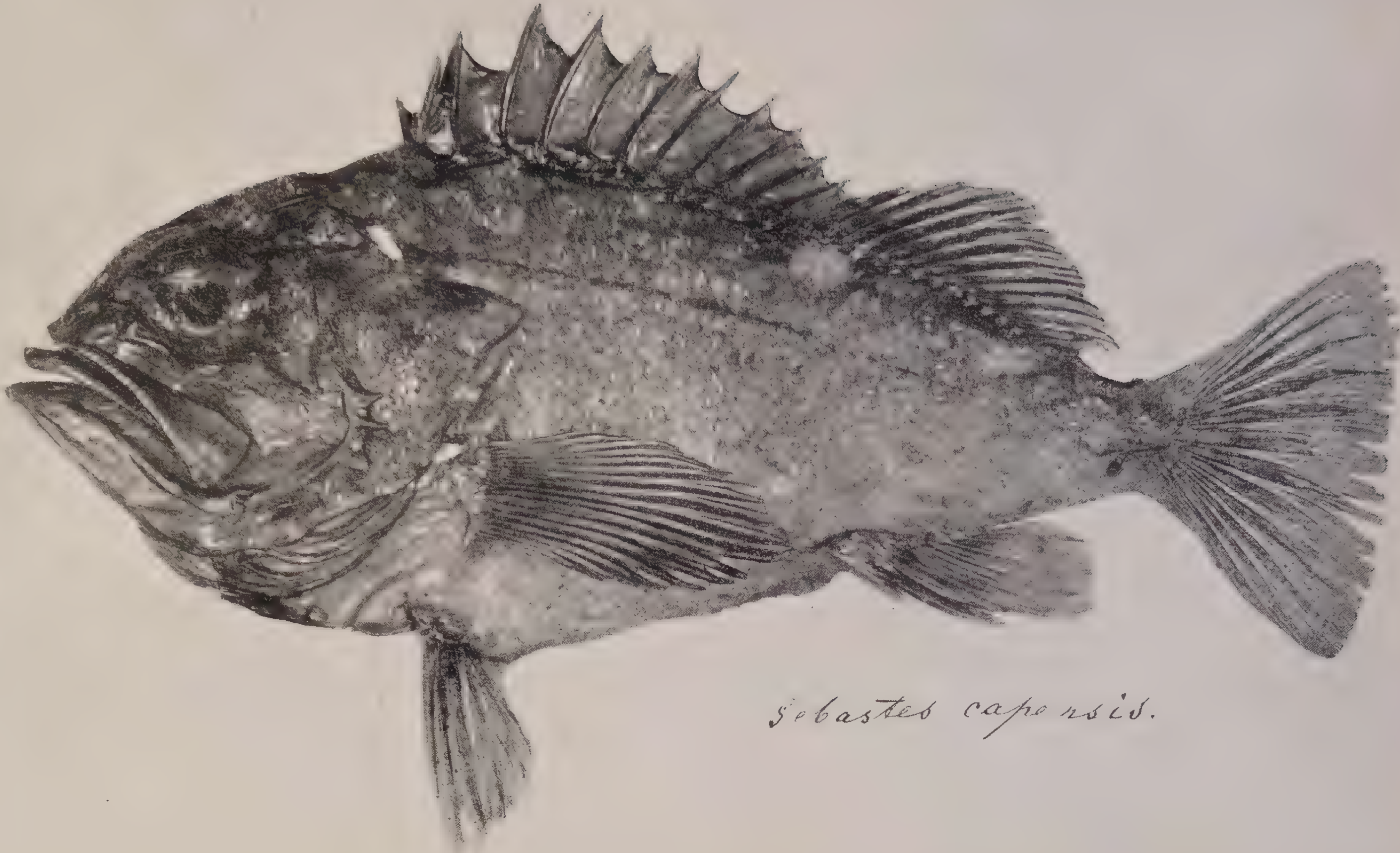

53.11.12.101.
Acanthurus chirurgus.

PLATE 32

Sebastichthys capensis (Gmelin). Holotype.



Sebastes capensis.

PLATE 33

Congiopodus torvus (Gronovius). Holotype.

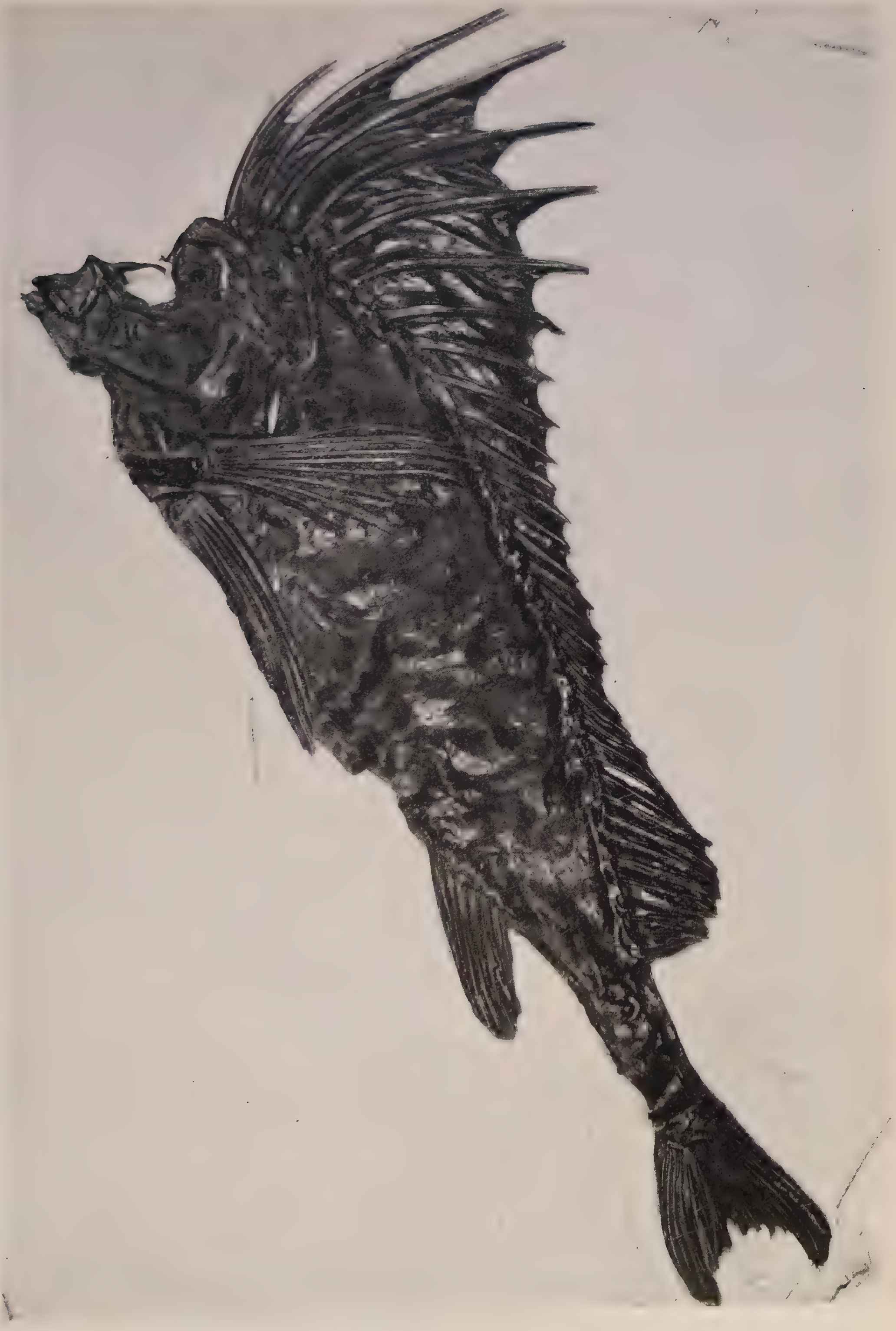
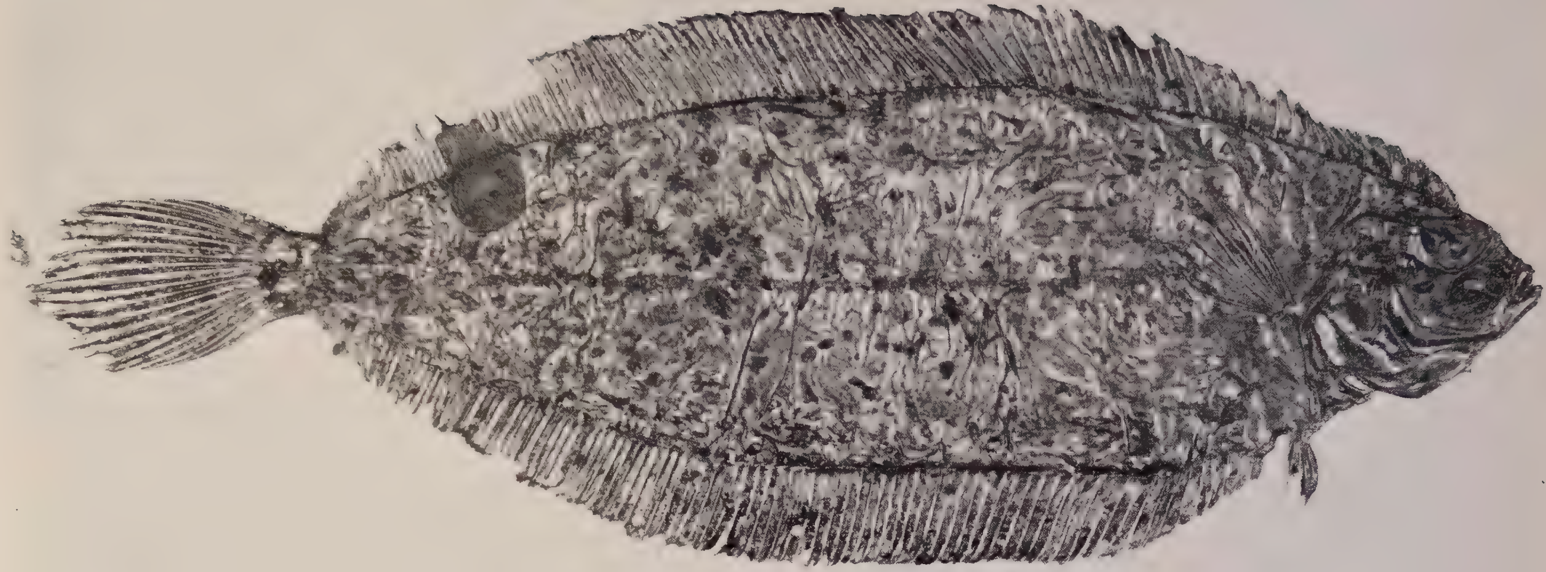


PLATE 34

Glyptocephalus cynoglossus (L.). Holotype.



Pleuronectes cynoglossus.

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